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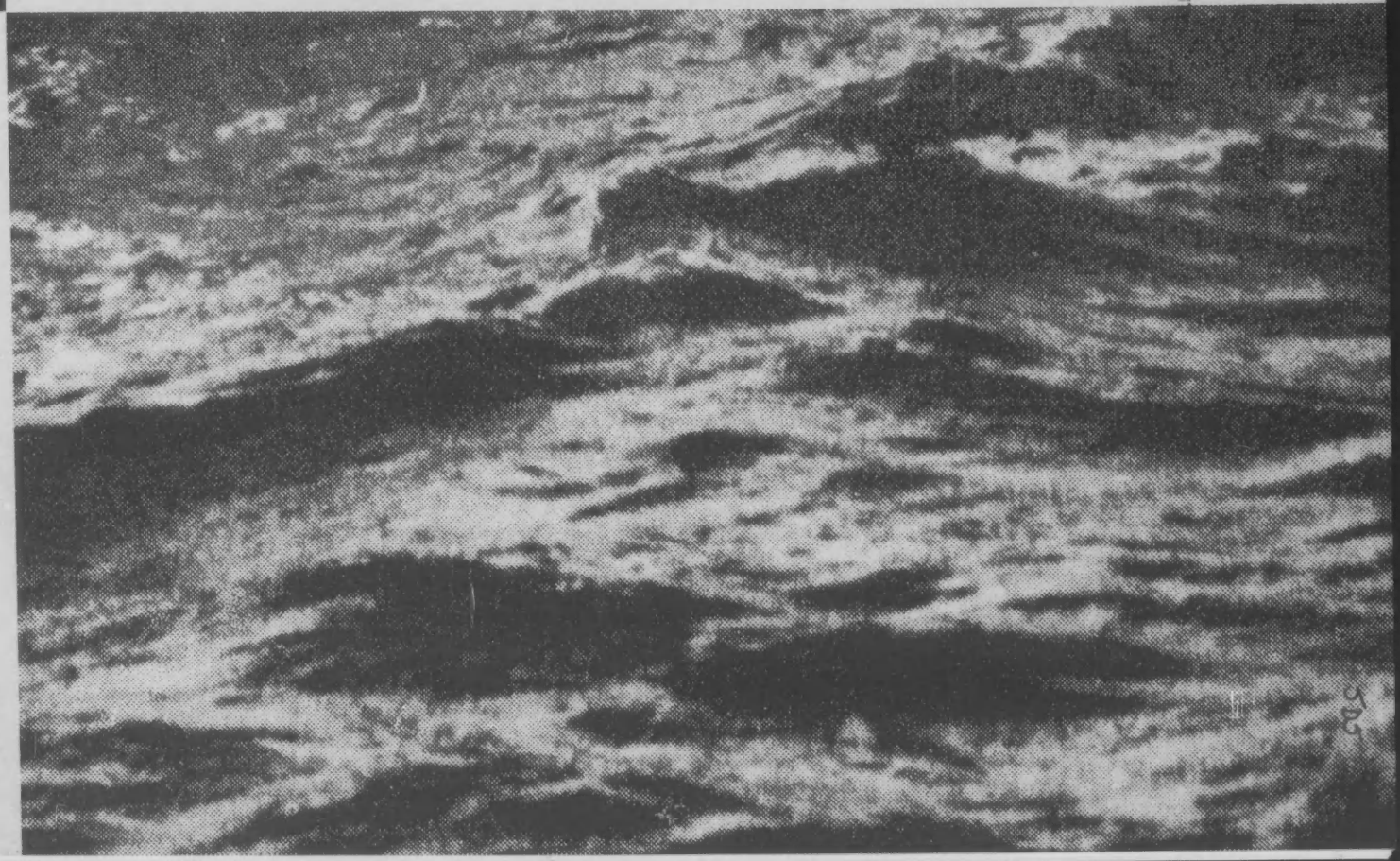

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UNITED STATES DEPARTMENT OF COMMERCE
Peter G. Peterson, *Secretary*

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
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Frank T. Piskur
Editor

0.35 IMMUNOCHEMISTRY OF SPERM WHALE MYOGLOBIN. X. REGIONS RESPONSIBLE FOR IMMUNOCHEMICAL CROSS-REACTION WITH FINBACK WHALE MYOGLOBIN. SOME GENERAL CONCLUSIONS CONCERNING IMMUNOCHEMICAL CROSS-REACTION PROTEINS

Atassi, M. Z., and B. J. Saplin (Department of Chemistry, Wayne State University, Detroit, MI 48202)
Biochemistry 10, No. 25, 4740-4747 (December 7, 1971)

The authors report on detailed studies on the immunochemical cross-reaction of finback whale myoglobin with antisera to sperm whale myoglobin and of sperm whale myoglobin with antisera to finback whale myoglobin.
[3 figures, 9 tables, 28 references] FTP

0.36 METABOLIC EVIDENCE AGAINST THE ROLE OF 2-ACYL GLYCEROLS IN THE BIOSYNTHESIS OF 1-ALKYL-2,3-DIACYL GLYCEROLS IN MARINE FISH

Malins, D. C., and P. A. Robisch (Pioneer Research Laboratory, National Marine Fisheries Service, NOAA, 2725 Montlake Blvd. East, Seattle, WA 98102 U.S.A.)
Biochimica et Biophysica Acta, Lipids and Lipid Metabolism 248, No. 3, 430-433 (December 14, 1971)

In order to determine the possible precursor role of 2-acyl glycerols in lipid biosynthesis, the researchers examined (1) the molecular structures of the 1-alkyl-2,3-diacyl glycerols in the liver of dogfish (Squalus acanthias) and (2) the uptake of radioactivity into acyl positions 2 and 3 after administration of [1-^{14}C]palmitic acid in vivo. The authors indicate that the molecular structures of 1-alkyl-2,3-diacyl glycerols from the liver of dogfish reveal an accumulation of C_{20} and C_{22} polyenoic acids on position 2 that is characteristic of marine glycerolipids; the presence of these acids on position 2 may imply biosynthesis from exogenous 2-acyl glycerols. However, the present data on incorporation of radioactivity from [1-^{14}C]palmitic acid revealed extensive metabolism of acyl groups on position 2 and argues against such a pathway. However, a small degree of biosynthesis of 1-alkyl-2,3-diacyl glycerols from a discrete pool of exogenous 2-acyl glycerols, containing polyenoic acids resistant to metabolism, cannot be excluded.
[2 tables, 15 references] FTP

0.38 ENZYMATIC DEGRADATION OF WHALE CARTILAGE KERATOSULFATE
(0.5)(0.34)
(1.953)

Kitamikado, Manabu, Ryuji Ueno, and Takashi Nakamura (Laboratory of Fishery Technology, Faculty of Agriculture, Kyushu University, Fukuoka, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 36, No. 6, 592-596 (June 1970), and No. 11, 1172-1180 (November 1970)
In Contributions From the Department of Fisheries and the Fishery Research Laboratory, Kyushu University, No. 16 (1970)

In 1953, Meyer et al. found a mucopolysaccharide composed of N-acetylglucosamine, galactose, and sulfate in bovine cornea. They named it keratosulfate. In 1961, Seno found keratosulfate (KS) in whale nasal cartilage, and Furuhashi found it in elasmobranch cartilage. The present authors attempt to find a bacterium that will degrade KS and to obtain a KS-degrading enzyme from the culture fluid of the bacterial strain. Such an enzyme would be useful in investigations of the detailed structure not only of whale KS but of various connective tissues.

I. Isolation of a Keratosulfate-Degrading Bacterium; pp. 592-596.
The procedures used and problems encountered in isolating one species of bacterium that would exhibit appreciable KS-degrading activity are discussed. A bacterium isolated from human stools was inoculated in heart infusion broth containing 0.3% whale cartilage KS and incubated at 37° C. It consumed almost all the KS within 2 days.
[1 figure, 1 table, 18 references]

(over)

0.38 [ISOZYMES OF ASPARTATE AMINOTRANSFERASE IN THE SKELETAL MUSCLE OF CARP]
ISOZYME DER ASPARTAT-AMINOTRANSFERASE IN DER SKELETMUSKULATURE DES KARPFENS

Masic, Djurdjica, and Reiner Hamm (Institut für Chemie und Physik der Bundesanstalt für Fleischforschung, Kulmbach, Germany)
Archiv für Fischereiwissenschaft 22, No. 2, 110-120 (October 1971) (In German)

The total aspartate aminotransferase (glutamate oxaloacetic transaminase, GOT) activity of white carp muscle is of the same magnitude as that of porcine M. longissimus dorsi. Red carp muscle showed higher GOT activity than did white carp muscle. Four GOT isozymes were found (after electrophoretic separation) in the extract of light carp muscle. One isozyme was found in the sarcoplasma; the other three, in the mitochondrial fraction.
[2 figures, 3 tables, 34 references] FTP

0.38 (0.5) STUDIES ON COLLAGENASE OF A MARINE BACTERIUM. PART I. THE ISOLATION AND DETERMINATION OF MICROORGANISM PRODUCING COLLAGENASE

Hanada, Kazunori, Taku Mizutani, Michio Yamagishi, Masaharu Tamai, Hikoji Tsuji, Tetsuo Misaki, and Jiro Sawada (Research Laboratory, Taisho Pharmaceutical Co., Ltd., No. 34-1, Takata 3-chome, Toshimaku, Tokyo, Japan)
Agricultural and Biological Chemistry 35, No. 11, 1651-1659 (November 1971)

In this study the researchers were looking for a marine bacterium that could produce, extracellularly, collagenase under aerobic conditions. They isolated such a bacterium, strain 7-246-6, from sea water that produced an extracellular enzyme specific for native collagen and gelatin. The strain was similar to Pseudomonas marinoglutinosa, morphologically and physiologically except that it differed slightly from P. marinoglutinosa in the following aspects: the shape of the colony on the plate culture, the optimum growth temperature, the presence of granular structure (as determined by granular staining), the utilization of carbohydrates, and the number of flagella.
[5 figures, 8 tables, 27 references] FTP

0.4 POLYCHLORINATED BIPHENYLS (PCB): EFFECT ON MITOCHONDRIAL ENZYME SYSTEMS

Pardini, Ronald S. (Division of Biochemistry, University of Nevada, Reno, NV 89507)
Bulletin of Environmental Contamination and Toxicology 6, No. 6, 539-545 (November-December 1971)

The effect of eight various PCB samples on heavy beef heart mitochondria NADH-oxidase and succinoxidase enzyme systems was determined. The data indicate that all the PCBs tested inhibit the NADH-oxidase system and the succinoxidase system. [3 tables, 18 references] FTP

0.38 (9.19) CARBONIC ANHYDRASE INTERACTION WITH DDT, DDE, AND DIELDRIN

Pocker, Y., W. M. Beug, and V. R. Ainardi (Department of Chemistry, University of Washington, Seattle, WA 98105)
Science 174, No. 4016, 1336-1339 (December 24, 1971)

Carbonic anhydrase (CA) catalyzes the reversible hydration of the reaction:

$$CO_2 + H_2O \overset{CA}{\rightleftharpoons} HCO_3^- + H^+$$

It is found in animals, in plants, and in some bacteria. In the present study, the authors examined the effects of DDT, its stable metabolite DDE, and dieldrin on carbonic anhydrase.

They conclude that DDT, DDE, and dieldrin are not true inhibitors of CA action (as is currently believed). These pesticides have the ability, when added in excess of their solubility limit, to occlude small amounts of CA from solution during the course of crystal formation. The amounts of CA occluded depend on the conformational and topographical characteristics of the particular CA molecules.
[1 figure, 1 table, 32 references] FTP

0.38 (0.5)(0.34)(1.953)

II. Identification of a Keratosulfate-Degrading Bacterium; pp. 1172-1174.
The KS-degrading bacterium was identified as Escherichia freundii, a species of common enteric bacteria. Its morphological, cultural, and biochemical characteristics are tabulated.
[2 tables, 3 references]

III. Purification of a Bacterial Keratosulfate-Degrading Enzyme; pp. 1175-1180.
[Reported by Kitamikado and Ueno only]

The adaptive enzyme, capable of hydrolyzing glycosidic bonds in KS, produced by Escherichia freundii was purified by ammonium sulfate fractionation, Sephadex filtration, DEAE-cellulose chromatography, CM-cellulose chromatography, and CM-cellulose rechromatography. The specific activity of the electrophoretically homogeneous final preparation was about 1,750 times as much as that of the original culture fluid.
[3 figures, 1 table, 9 references] LB

0.38 QUALITY OF THUNNUS ALBACARES. CHEMICAL EVALUATION

Aldrin, J. F., and A. Grandgirard (Lab. Dir. Peches Marit. Lagunaires, Abidjan, Ivory Coast)
Chemical Abstracts 75, No. 19, 117281g (November 8, 1971)

0.321 (9.125) ELECTROPHORETIC HETEROGENEITY OF SERUM PROTEINS IN CARTILAGINOUS, GANOID AND TELEOST FISH

Lukʼyanenko, V. I., and A. V. Popov (Cent. Res. Inst. Sturgeon Ind., Astrakhan, U.S.S.R.)
Chemical Abstracts 74, No. 25, 137095g (June 21, 1971)

0.110 WOODEN LABORATORY CUPBOARDS FOR THE FIRE PROTECTION OF SOLVENTS

Stark, G. W. V. (Department of Environment, Fire Research Station, Boreham Wood, England), R. W. White, and G. E. Moseley (Agricultural Research Council, Institute of Animal Physiology, Babraham, Cambridge, England)
Chemistry and Industry No. 42, 1193-1195 (October 16, 1971)

The Institute of Animal Physiology and the Fire Research Station collaborated in the development of a wooden laboratory cupboard for the fire protection of solvents. The cupboard is intended to protect its contents for a short time so as to minimize the size of the fire to be controlled and to allow the staff to escape. [5 figures, 2 references] FTP

0.5 (2.43) MICROBIOLOGICAL CHANGES IN PREPACKED COD FILLETS IN RELATION TO THE OXYGEN PERMEABILITY OF THE FILM

Debevere, J. M., and J. P. Voets (Department of General and Industrial Microbiology, Faculty of Agricultural Sciences, University of Ghent, Coupure 533, Ghent, Belgium)
Journal of Applied Bacteriology 34, No. 3, 507-513 (September 1971)

The researchers examined the effects of oxygen permeability of different polyethylene films and storage temperatures on the deterioration of cod fillets and the relation of these parameters to the formation of total volatile basic nitrogen, trimethylamine nitrogen, and formalin bound nitrogen and to the growth of total aerobic microflora and of spoilage organisms. The objective was to establish standards to which a film must conform in order to be proposed for the packaging of fish. A polyvinyl chloride film and a laminate composed of regenerated cellulose and polyethylene were used. Films of thickness of 20, 30, 40, 50, and 100 μm were used having nominal oxygen permeability of, respectively, 3,600, 2,100, 1,800, 1,500, and 50 ml. of $O_2/m^2/24$ hr. Storage temperatures were 0°, 3°, and 6° C.

The spoilage of the packaged cod fillets is not related to oxygen permeability of the film. The deterioration curves for the fillets stored at 3° and 6° C. were the same as that for the fillets stored at 0° C. Apparently, a film with approximately 3,600 ml./m^2/24 hr. oxygen permeability gives the best results.
[5 figures, 3 tables, 7 references] FTP

0.5 AN IMPROVED MEDIUM FOR DETECTION OF CLOSTRIDIUM BOTULINUM TYPE E

Lilly, T., Jr., S. M. Harmon, D. A. Kautter, H. M. Solomon, and R. K. Lynt, Jr. (Food and Drug Administration, U.S. Department of Health, Education, and Welfare, Washington, DC 20204)
Journal of Milk and Food Technology 34, No. 10, 492-497 (October 1971)

This enrichment medium (TPGYT) for detection of Clostridium botulinum type E contains trypticase, peptone, glucose, yeast extract, and 1 mg. of trypsin/ml. It was designed to potentiate toxin (by trypsin) as produced and to destroy the boticins (rapidly destroyed by proteolytic enzymes) of competing type E variants in cultures of food and environmental materials. This paper is a summary of data collected on the use of the medium to detect the type E organisms in 283 samples of various shellfish products and 227 samples of sediments.

The 510 samples yielded 214 positive cultures of type E (126 from the sediments and 86 from the shellfish samples) using the TPGYT medium (containing trypsin); this total number of positives was approximately four times the number of positives obtained in the same medium (TPGY) free of trypsin. Using TPGYT, type E toxin was detected in all smoked fish that had been inoculated with 4 to 100 type E spores per fish. Incorporating trypsin into TPGY caused no reduction in type A or proteolytic type B toxin production from spore inocula. Also, toxins of nonproteolytic types B and F in pure culture were fully potentiated in the TPGYT (trypsin-containing) medium.
[7 tables, 22 references] FTP

0.6 SYMPOSIUM: OILSEED PROCESSORS CHALLENGED BY WORLD PROTEIN NEED

(Authors and subjects listed below)
Journal of the American Oil Chemists' Society 48, No. 9, 473-498 (September 1971)

The symposium was presented at the ISF-AOCS Congress, Chicago, Ill., September 1970. Articles of interest to fishery technologists are:

"Marketing Considerations for Improved Protein Food Products," by A. N. Meiss and S. M. Cantor (Sidney M. Cantor Associates, Inc., Haverford, Pa. 19041), pp. 473-476.

Improved protein foods must be classless and must be introduced simultaneously at all levels of society if they are to be effective and accepted by the target consumers. Successful market development of improved protein food products in less developed countries requires a systems approach in which interrelationships among food availabilities, nutritional needs, acceptability factors, and purchasing power are evaluated in the context of the total food system of the country. [9 references]

"The Functional Requirements for Foods," by Karl F. Mattil (Texas A&M University, College Station, Tex. 77843), pp. 477-480.

The author gives examples of the influence of the ionic environment of one basic functional property of proteins, their solubility in aqueous solutions.
[5 figures, 5 references]

"Textured and Shaped Oilseed Protein Food Products," by M. D. Wilding (Research and Development Center, Swift and Co., Oak Brook, Ill. 60521), pp. 489-491.

This paper briefly discusses the production, functional aspects, and nutritional aspects of textured and shaped oilseed proteins.
[4 figures, 1 table, 8 references]

(over)

0.7 (6.54) EFFECTS OF LYSINE ON DOUGH AND PROTEIN QUALITY OF WHOLE WHEAT MEAL CHAPATIS AND LEAVENED BREAD

Tara, K. Alasingrachar, M. Srinivasa Murthy Usha, and G. Singh Bains (Central Food Technological Research Institute, Mysore-2A, India)
Journal of Agricultural and Food Chemistry 20, No. 1, 116-118 (January-February 1972)

In certain developing countries, the bulk of wheat is used as wheat meal (atta). The atta is used chiefly in unleavened pancakes (chapatis). The present authors felt that there was a great potential for the use of fortified whole wheat meal yeast bread in such countries. Therefore, they studied the effects of lysine on the dough properties of whole wheat meal and losses in baking in relation to the quality of protein in chapatis and yeast bread.

The farinograph water absorption dough development time and stability of whole wheat meal (atta) were not affected by the incorporation of L-lysine monohydrochloride at levels of 0.1-0.4%. Chapatis made of fortified whole wheat meal containing 0.15% L-lysine monohydrochloride, showed a negligible loss of lysine; chapatis made of fortified whole wheat meal containing 0.20% L-lysine monohydrochloride showed a loss of 12.5% of the lysine content. The protein efficiency ratios (PER) of fortified chapatis and of bread (2.04 and 2.21, respectively) were significantly higher than those of similar products prepared from unfortified whole wheat meal (1.48 and 1.36, respectively).
[1 figure, 2 tables, 14 references] FTP

0.5 (3.19) MODE OF ACTION OF ETHYLENE OXIDE ON SPORES OF CLOSTRIDIUM BOTULINUM 62A

Winarno, F. G., and C. R. Stumbo (Department of Food Science and Technology, University of Massachusetts, Amherst, MA 01002)
Journal of Food Science 36, No. 6, 892-895 (September-October 1971)

The authors attempted to determine the mode of lethal action of ethylene oxide on spores of Clostridium botulinum 62A. Death of spores of the organism, when they were exposed to gaseous ethylene oxide, followed first order kinetics. It appears that the lethal action of ethylene oxide on the spores of C. botulinum is through alkylation of both guanosine triphosphate and adenosine triphosphate of DNA (deoxyribonucleic acid).
[5 figures, 24 references] FTP

2.05 FACTORS AFFECTING THE PRODUCTION OF BACTERIAL FOOD POISONING TOXINS

Baird-Parker, A. C.
J. appl. Bact. 34, No. 1, 181-197 (1971)
BFMIRA Abstracts 24, No. 11, Abstract No. 3696, 754 (November 1971)

Intracellular factors and the external factors--nutritional requirements of Staphylococci, pH of the substrate, temperature, atmosphere, curing salts and other microorganisms which affect the production of staphylococcal enterotoxins are considered as well as the production of these toxins in dairy products, fresh and cured meats and prawns. Botulinum toxins are considered in the same manner. Mention is made of the bongkrek toxins associated with fermented coconut products. Work on toxins which may be associated with Clostrium [sic] welchii, Vibrio parahaemolyticus and salmonella food poisoning is discussed. (From Paper XIV of the symposium on microbial changes in foods.) C.C.E. Reprinted

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0.6 "Odor and Flavor Responses to Additives in Edible Oils," by G. D. Evans, Helen A. Moser, and G. R. List (Northern Regional Research Laboratory, U.S. Department of Agriculture, Peoria, Ill. 61604), pp. 495-498.

The authors determined the odor threshold for a series of unsaturated ketones, secondary alcohols, hydrocarbons, and substituted furans when the compounds were added to bland edible oil.
[4 tables, 32 references] FTP

0.5 STAPHYLOCOCCUS AUREUS AND STAPHYLOCOCCAL FOOD INTOXICATIONS. A REVIEW. I. THE STAPHYLOCOCCI: CHARACTERISTICS, ISOLATION, AND BEHAVIOR IN ARTIFICIAL MEDIA

Minor, T. E., and E. H. Marth (Department of Food Science and the Food Research Institute, University of Wisconsin, Madison, WI 53706)
Journal of Milk and Food Technology 34, No. 11, 557-564 (November 1971)

This article is a review of the literature of only that material on the nature of the staphylococci as it is related to food intoxications. (Parts II, III, and IV will be published in subsequent issues of the Journal; all references cited for all parts will appear at the end of part IV.)
[2 tables] FTP

0.7 SOY PROTEIN QUALITY

Anonymous
Nutrition Reviews 29, No. 11, 245-246 (November 1971)

Formula feedings based on isolated soy protein are as effective as cow's milk in the rehabilitation of malnourished infants. Abstract reprinted

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0.5 (9.19) DEGRADATION OF DIELDRIN TO CARBON DIOXIDE BY A SOIL FUNGUS TRICHODERMA KONINGI

Bixby, M. W., G. M. Boush, and F. Matsumura (Department of Entomology, University of Wisconsin, Madison, WI 53706)
Bulletin of Environmental Contamination and Toxicology 6, No. 6, 491-494 (November-December 1971)

The authors found that Trichoderma koningi is capable of degrading one or more of the carbons on the chlorinated ring of the dieldrin molecule.
[1 figure, 1 table, 9 references] FTP

0.5 TEMPERATURE CYCLING EFFECTS ON BACTERIAL GROWTH. I. PSEUDOMONAS FLUORESCENS

Howell, A. J., R. L. Saffle, and J. J. Powers (Department of Food Science, University of Georgia, Athens, GA 30601)
Journal of Food Science 36, No. 5, 778-780 (July-August 1971)

The purpose of this study was to determine the effect of mild cycling of temperature on the growth of Pseudomonas fluorescens. A thermal gradient-bar, similar in design to the one developed by C. H. Oppenheimer and W. Drost-Hansen [Journal of Bacteriology 80, 21 (1960)] was used. The effect of mild cycling of temperature on the growth of the organism seemed to depend upon whether the temperature was above or below the optimum temperature for growth. Growth response of the organism was greater when the temperatures were cycled down than when the temperatures were cycled up.
[6 figures, 1 table, 14 references] FTP

0.7 (0.4) ENVIRONMENTAL NITROSO COMPOUNDS: REACTION OF NITRITE WITH CREATINE AND CREATININE

Archer, Michael C., Stephen D. Clark, Joan E. Thilly, and Steven R. Tannenbaum (Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, MA 02139)
Science 174, No. 4016, 1341-1343 (December 24, 1971)

The authors investigated the mutual reactivity of nitrite, creatine, and creatinine. These compounds are abundant in the environment and are frequently ingested simultaneously in a normal diet. It is possible, the authors state, that nitrosamines will form in the environment whenever nitrite and secondary and tertiary amines occur together.

Under acidic conditions, creatine reacts with nitrite to produce first sarcosine then N-nitrososarcosine (a weak carcinogen in the rat). Creatinine reacts with acidified (HCl) nitrite to produce either creatinine-5-oxime or 1-methylhydantion-5-oxime (depending upon the conditions of the reaction). The toxicity of these compounds is not known. [2 figures, 16 references] FTP

0.8 AHEAD: ACTIVATED ALGAE?

McKinney, Ross E. (University of Kansas, Lawrence, Kans. 66044), E. C. McGriff (Mississippi State University, State College, Miss. 39762), R. J. Sherwood (Envirotech Corp.), V. N. Wahbeh and D. W. Newport (Black and Veatch)
Water and Wastes Engineering 8, No. 9, 51, 52, 64 (September 1971)

This article is a review of background information on the use of activated algae to treat domestic sewage. Work on the process is being done at the University of Kansas and the University of Mississippi. Key to this new waste treatment system is the application of basic concepts of microbial flocculation to the use of algae. [2 figures, 6 references] FTP

1.017 SEAFOOD REPORT NOW AVAILABLE

Anonymous
Australian Fisheries 30, No. 10, 10 (October 1971)

The report entitled "Seafood Processing" by the Department of Trade and Industry of Australia is now on sale for $2.24 (in Australia) and $2.25 (overseas). It covers information on the structure, capacity, production, distribution and trade of the industry with a view to examining industry problems and assessing future prospects. Copies can be obtained from the Australian Government Publishing Service, P.O. Box 84, Canberra, A.C.T. FTP

1.012 SYMPOSIUM ON INVESTIGATIONS AND RESOURCES OF THE CARIBBEAN SEA AND ADJACENT REGIONS

Anonymous (Report edited by the staff of the Marine Biology and Engineering Branch, Fisheries Resources Division, FAO, Rome, Italy)
FAO, Fisheries Reports, No. 71.2, 347 pp. (September 1971)

This report contains the full texts (in their original language) of the papers contributed to the Fisheries Resources Section of the Symposium on Investigations and Resources of the Caribbean Sea and Adjacent Seas. The symposium was organized jointly by UNESCO and FAO and cosponsored by WMO and was held in Willemstad, Curacao, from 18 to 26 November 1968. The symposium was carried out in preparation for the Cooperative Investigations in the Caribbean and Adjacent Regions started in 1970 under the auspices of the Intergovernmental Oceanographic Commission. FTP

1.016 PRELIMINARY LIST OF THE INLAND WATERS OF AFRICA AND THEIR CHARACTERISTICS

Welcomme, Robin L. (Inland Fishery Resources Branch, Fishery Resources Division, Department of Fisheries, FAO, Rome, Italy)
FAO Fisheries Circular No. 134, 38 pp. (December 1971) (Distribution restricted)
FAO, Rome, Italy)

This circular contains hydrographic information on the important waterways of Africa. Data for the report was obtained from various FAO publications and from 23 other reference sources. [Contains 6 maps] FTP

1.0119 SOVIET-CUBAN FISHERY RESEARCH

Bogdanov, A. S. (editor)
Pishchevaya Promyshlennost (1965) (Moscow). Translation available from the National Technical Information Service, U.S. Department of Commerce, Sills Bldg. Springfield, Va. 22151. Order No. TT 69-59016.
NOAA Publications Announcement No. 71-77, 8, Item 71-17-16-20 (October 1971)

In September 1962 the governments of the USSR and Cuba concluded an agreement on sea fishing, which opened up new horizons and possibilities for development of fishing and scientific fishery investigations in the western part of the Atlantic Ocean, especially in tropical and subtropical regions. Investigations were carried out on modern Soviet fishery research vessels equipped with the latest scientific instruments and fishing gear. Fishery science, which assists the industry in solving technical problems, must first study the condition of the resources of commercial marine fish, patterns of their distribution, biology, and features of their behavior related to their environment. Investigations were carried out simultaneously on organization and techniques of fishing, increasing the storage period of caught fish, mechanization of processing, and optimal utilization of the raw material for food and for manufactured products. The result of the investigations is summarized in this collection of papers by Soviet and Cuban scientists. (SK) Reprinted

1.23 (9.2) ATLANTIC MENHADEN (BREVOORTIA TYRANNUS) RESOURCE AND FISHERY -- ANALYSIS OF DECLINE

Henry, Kenneth A. (NOAA, National Marine Fisheries Service, Biological Laboratory, Seattle, Wash. 98102)
NOAA Technical Report NMFS SSRF-642, 32 pp. (August 1971) Order No. COM-71-50357, (National Technical Information Service, U.S. Department of Commerce, Sills Building, Springfield, Va. 22151)
NOAA Publications Announcement No. 71-77, 5, Item 71-17-16-04, (October 1971)

After record catches in 1961 and 1962 of about 2.3 billion pounds (1.043 million metric tons) of menhaden (Brevoortia spp.), the U.S. catch declined to about 1.2 billion pounds (0.544 million metric tons) in 1967. Most of the decrease was in the North Atlantic and Middle Atlantic. Since about 1940, catches had increased, in general, with increased fishing effort. In recent years, however, the catch per unit of effort (a standard vessel day) has declined markedly. It fell from about 148,000 pounds (67.1 metric tons) in 1962 to about 38,000 pounds (17.2 metric tons) in 1967 in the North Atlantic and from 140,000 pounds (63.5 metric tons) in 1962 to 51,000 pounds (23.1 metric tons) in 1967 in the Middle Atlantic. The catch per unit of effort in these two areas improved in 1968, but fishing effort was at such a low level that the increase is of doubtful significance. (Author abstract, mod. by WT) Reprinted

0.9 (9.19) DESIGN AND SYNTHESIS OF CONTROLLED RELEASE PESTICIDE-POLYMER COMBINATIONS

Allan, G. G., C. S. Chopra, A. N. Neogi, and R. M. Wilkins (College of Forest Resources, University of Washington, Seattle, WA 98105)
Nature 234, No. 5328, 349-351 (December 10, 1971)

Use of persistent pesticides is undesirable because they may be frequently incorporated into the food chain. On the other hand, use of pesticides with short lives tends to be ineffective. Both types of pesticides are often applied in amounts grossly in excess of that actually required to control the pest to compensate for the loss of pesticide by leaching and evaporation. The present workers examined the potential of pesticide-polymer combinations for securing controlled release of a biodegradable pesticide in the correct amount needed over an appropriate period of time. Such controlled pesticide release systems are currently being tested for forestry applications. In the present article, the authors discuss two approaches: (1) pesticide release by diffusion through polymers and (2) pesticide release by degradation of a polymer containing the pesticide as a pendant side chain.

For approach (1) the active pesticide is dissolved or encapsulated in a polymeric matrix and the combination is placed in the medium where pesticidal activity is desired. Release of pesticide occurs by diffusion. For approach (2), the pesticides, exemplified by the herbicidal phenoxyacetic acids (RCOOH), are chemically attached as a pendant substituent to a natural or synthetic water-soluble or insoluble polymer having a replaceable hydrogen as formulated in the equation:

$$\text{Polymer-X-H} + \text{RCOOH} \underset{\text{environment}}{\overset{\text{synthesis}}{\rightleftharpoons}} \text{Polymer-X-COR (where X = N, O, or S).}$$

[3 figures, 16 references] FTP

0.8 PORT AND HARBOR DEVELOPMENT SYSTEM. PHASE 1 - DESIGN GUIDELINES WORK REPORT

Prepared by the staff of the Architecture Research Center, College of Architecture and Environmental Design, Texas A&M University, College Station, TX 77843
Report TAMU-SG-71-216, 140 pp. (August 1971)

This report is intended to aid those who are involved in and responsible for port and harbor planning and design. The various sections of the report include: (1) an analysis of present harbor design features (types, location, administration, transportation, cargo handling, labor, support industry, safety, finance); (2) a step-by-step description of the requirements in port design and construction (decision, preliminary, site investigation, general review, harbor and channel, breakwaters, terminals, offshore structures, buildings, dock types, dry docks, piles, fender systems, mooring, dolphins, moles, trestles, and catwalks); (3) a description of important trends in marine transportation and technology; and (4) suggestions for planning and design concepts for ports in different stages of development. [profusely illustrated; bibliography lists 47 books, 20 governmental publications, 26 reports, 19 articles, and 5 papers] FTP

[1 figure, 8 tables, 11 references]

0.5 VARIATION IN THE BACTERIAL FLORA IN CHILL STORED SEA WATER

Tajima, Kenichi, Yoshio Ezura, and Minoru Sakai (Laboratory of Microbiology, Faculty of Fisheries, Hokkaido University, Hakodate, Japan)
Bulletin of the Faculty of Fisheries Hokkaido University 22, No. 1, 80-90 (May 1971) (In Japanese)

The author comments on the proposed names [R. H. Payne, A. R. Child, and A. Forrest, Nature 231, 250 (1971)] of the European subspecies of the Atlantic salmon Salmo salar of "europaeus" and "americanus." He indicates that the European subspecies of the Atlantic salmon should be called Salmo salar salar Linnaeus. FTP

1.30 SALMON NOMENCLATURE

Gruchy, C. G. (Ichthyology Unit, Natural Museum of Natural Sciences, Ottawa K1A0M8, Ontario, Canada)
Nature 234, No. 5328, 360 (December 10, 1971)

1.86 (9.14)(9.16) EFFECTS OF TEMPERATURE AND SALINITY ON GROWTH, FOOD CONVERSION, SURVIVAL AND TEMPERATURE RESISTANCE OF JUVENILE BLUE CRABS, CALLINECTES SAPIDUS RATHBUN

Holland, J. S., D. V. Aldrich, and Kirk Strawn (Department of Wildlife and Fisheries Sciences, Texas A&M University)
Sea Grant Publication TAMU-SG-71-222, xii + 166 pp. (August 1971) (Texas A&M University Sea Grant Program and the Moody Foundation, Galveston, Tex.)

Rees (1967) ranks the blue crab [Callinectes sapidus Rathbun] as economically the third most important marine organism of Chesapeake Bay, the South Atlantic coast and the Gulf of Mexico, outranked only by the shrimp, Penaeus sp., and oyster, Crassostrea virginica. Although large populations of blue crabs exist along the Atlantic and Gulf coasts of the United States, annual fluctuations in abundance create many problems for the fishing and packing industries dependent upon these populations.

A possible solution to the fluctuation of abundance of natural populations of blue crabs and a means of alleviating the thermal loading of estuaries lies in pond culture. By heating culture ponds with thermally-loaded water, two beneficial results could be realized. First, blue crabs could be kept at temperatures at which they could grow during periods when natural water temperatures would prevent their growth. Second, culture ponds could serve as retention basins to lower the temperature of heated water before it is returned to the estuary.

The general objective of this study is to supply information vital to the commercial culture of the blue crab on the Texas Gulf Coast.
[36 figures, 32 tables, 84 references] From authors' introduction

1.85 (1.0117)(9.12) THE SHRIMP LEPTALPHEUS FORCEPS IN OLD TAMPA BAY, FLORIDA

Saloman, Carl H. (NOAA, National Marine Fisheries Service, Biological Laboratory, St. Petersburg Beach, Fla.)
Quarterly Journal of the Florida Academy of Sciences 34, No. 1, 66-77 (March 1971)
NOAA Publications announcement No. 71-77, 9, Item 71-17-16-23 (October 1971)

The alpheid shrimp, Leptalpheus forceps Williams, was collected in Old Tampa Bay, Fla., during studies of benthic invertebrates. This marked the first collection of the species outside the type locality, Beaufort, N.C. It was reported there by Williams (1965) as a commensal in burrows of the macruran crustacean, Upogebia affinis. The purpose of this report is to document occurrence of the shrimp in Old Tampa Bay, describe the collection site, and record certain ecological conditions in the habitat. These features include sediment type and hydrology within the burrows and from surrounding water. Abundance, size, and reproductive state are also recorded. (Author) Reprinted

2.01 (0.5) BIOCHEMICAL CHANGES IN SHRIMP INOCULATED WITH PSEUDOMONAS, BACILLUS AND A CORYNEFORM BACTERIUM

Cobb, B. F., III, and C. Vanderzant (Animal Science Department, Texas A&M University, College Station, TX 77843)
Journal of Milk and Food Technology 34, No. 11, 533-540 (November 1971)

In this paper, the authors describe the biochemical and organoleptic changes that take place in shrimp inoculated with species of Pseudomonas, Bacillus, and a coryneform bacterium. The biochemical parameters examined were: volatile nitrogen, volatile acid, volatile reducing substances, total volatile nitrogen, trimethylamine nitrogen, nonprotein nitrogen, water-soluble proteins, salt-soluble proteins, free amino acids, and size and shape of proteins as measured by Sephadex chromatography. The shrimp (Panaeus setiferus) were prepared as follows: They were headed and peeled aseptically. The shrimp meats were rinsed in tap water, washed with ethanol, then washed with sterile de-ionized distilled water. Sterile "shrimp juice" was also prepared. Test samples consisted of control (not inoculated) shrimp, inoculated shrimp, control (not inoculated) shrimp juice, and inoculated shrimp juice. Test samples were stored at 5° C.

Samples of shrimp inoculated with species of Pseudomonas became spoiled 2 to 3 days earlier than did the controls (noninoculated samples); those inoculated with species of coryneform bacteria showed delayed spoilage; and those inoculated with species of Bacillus spoiled about the same time as did the controls. The

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2.1471 THE SHRIMP-FISH SEPARATOR TRAWL: PRELIMINARY OBSERVATIONS ON ITS INTRODUCTION INTO THE OREGON FISHERY

Jurkovich, Jerry E. (NOAA, National Marine Fisheries Service, Exploratory Fishing and Gear Research Base, Seattle, WA 98102)
Proceedings of the National Shellfisheries Association 61, 8 (June 1971)
NOAA Publications Announcement No. 72-4, (72-04-16-01) 3 (February 1972)

Since 1967 we have been developing trawls that will separate ocean pink shrimp (Pandalus jordani) from fish and debris in the net while it is being towed over the ocean floor. Sorter trawls offer several advantages over conventional shrimp trawls; by allowing unwanted fish and debris to pass through the net, sorter trawls reduce laborious sorting of catches by hand aboard the vessel. They also conserve fish that otherwise would be discarded dead after sorting aboard the vessel and improve the quality of shrimp by eliminating crushing that normally occurs from large quantities of fish in the net when it is lifted aboard. Preliminary reports from fishermen using sorter trawls after the season opened in March 1970 indicated the trawls effectively sorted fish and debris but that they did not yield as large catches of shrimp as conventional shrimp trawls. Examination of weighed-out-weights and fishing logs, however, showed that boats using sorter trawls produced as much shrimp as vessels with conventional trawls. As a consequence, more captains of Pacific Northwest shrimp vessels are now converting their nets to sorter trawls.

(Author's abstract in part)

2.115 [A TREATISE TO THE PROBLEM OF HULL VIBRATIONS OF FISHING VESSELS AS A NOISE SOURCE IN REGARD TO FRIGHTENING OF FISH]
BEITRAG ZUM PROBLEM DES SCHEUCHENS VON FISCHEN DURCH SCHIFFSSCHWINGUNGEN ALS GERÄUSCHQUELLE

Karger, W. (Institut für Fangtechnik der Bundesforschungsanstalt für Fischerei, Hamburg, Germany)
Archiv für Fischereiwissenschaft 22, No. 2, 155-164 (October 1971) (In German)

The author made measurements of the vibrations aboard 11 fishing cutters, each of which had different hull and engine concepts. He wanted to find out whether it would be possible to reduce the level of noise radiated from fishing vessels. In spite of differences in construction of the 11 cutters, the intensities of sound radiating from them was of about the same level. The author concludes that damping of noise in fishing vessels is not economically possible now, and that it might be more rational to increase trawling speed so as to reduce the possibility of fish escaping the net.
[13 figures, 2 tables, 3 references] FTP

2.114 BOAT- OR SHIP-TYPE ANCHOR

Patten, Lowell Lloyd (pat.)
U.S. Patent 3,618,554
Official Gazette of the U.S. Patent Office 892, No. 2, 523 (November 9, 1971)

This is a fluke-type, marine mooring anchor that can be quickly converted from a folded restrained position to an open, working condition. FTP

2.3 (9.16) WEIGHT LOSS OF POND-RAISED CHANNEL CATFISH (ICTALURUS PUNCTATUS) DURING HOLDING IN PROCESSING PLANT VATS

Greenland, Donald C., and Robert L. Gill (National Marine Fisheries Service, NOAA, P.O. Box 711, Rohwer, AR 71666)
NOAA Technical Report NMFS SSRF-648, 7 pp. (December 1971) For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Price $0.25.

Most of the catfish processing plants located in Alabama, Arkansas, and Mississippi utilize live fish delivered to their plants to insure a high-quality finished product. These catfish are held in large concrete vats at the plants. As needed, fish are removed from the vats, killed, and run directly onto the processing line. Processors have often mentioned to us that the weight of fish being held for processing "shrinks" from pond-side weighings and that weight deductions for scrap fish and removal of dead catfish account for only a portion of the difference. These weight discrepancies have caused misunderstandings between farmers and processors. Without accurate "shrink" data, processors have been reluctant to consider changing plant facilities to try to reduce weight loss. Our assistance was requested to obtain data that would be helpful to processing plant managers in deciding whether fish weight losses were indeed a problem. During the winter of 1970-71, a study to determine this was conducted at the Southern Catfish Processors, Inc. in Dumas, Ark., by National Marine Fisheries Service personnel.

Some conclusions were as follows:

1. Channel catfish lose weight during holding. Most of the loss occurs during the first 48 hr and the test results showed 82.0% of the maximum average weight loss of 55 kg per metric ton (5.5 lb. per cwt) occurred during this period.

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2.1128 THE USE OF PVC COATINGS IN DUNGENESS CRAB POT CONSTRUCTION

Pereyra, Walter T. (National Marine Fisheries Service, NOAA, Exploratory Fishing and Gear Research Base, Seattle, WA 98102)
Pub. in Proceedings of the National Shellfisheries Association 61, 12 (June 1971)
Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151; Order No. COM-71-00888, Reprint.
Government Research Announcements 71, No. 20, 66-67 (October 25, 1971)

Experiments were conducted on the utility of polyvinyl chloride (PVC) as a substitute material for preventing or reducing electrolysis of Dungeness crab pots. Six pot frames were coated with PVC in lieu of the traditional rubber wrapping, webbed in the standard manner with stainless steel wire, and grounded to weight bars. Six other pots were constructed of two-by-four-inch wire mesh on the standard frame with the entire pot receiving a PVC coating. Three of each type of experimental pot were fished for 3 months by commercial fishermen at Newport, Oregon and Westport, Washington along with conventional gear. The PVC coating held up well to the rigors of commercial fishing, attesting to its durability. Slickness of the PVC, though, made it difficult to keep pots from sliding on deck. The pots with coated frames and stainless steel mesh fished as well as conventional pots. PVC-coated wire mesh pots fished only about one-half as well as conventional pots. In an effort to understand the apparent reduced catch rates of the PVC-coated wire mesh pots behavior experiments were carried out in a holding pen at Manchester, Washington. In these studies catch rates of PVC-coated pots were 2-3 times greater than conventional pots which is opposite to results from field trials.
(Author)

2.3 (9.16)

2. Weight loss was similar for fish held at densities of 320.3 and 640.6 kg per cubic meter (20.0 and 40.0 lb. per cu ft) of water but mortality was twice as much, 8.0%, for the higher concentrations of fish.

3. Handling the fish every 24 hr to weigh them did not contribute to weight loss but did cause mortalities of 4.5% and 8.0% to occur in containers with loadings of 320.3 and 640.6 kg of fish per cubic meter (20 and 40 lb. per cu ft) of water.

4. Fish held best in cool pond water of 8.9° to 15.0° C (48.0° to 59.0° F): they suffered no mortality and had a maximum weight loss of 2.0%. Similar fish held in vats with 21.7° C (71° F) water incurred twice the weight loss and had mortalities averaging 15.0% and 34.0%.

[3 figures, 2 tables] Reprinted in part

Shellfish, particularly oysters, are shucked by exposing them to microwaves and oxyacetylene heat. FTP

2.3 METHOD FOR SHUCKING SHELLFISH

Henry, Michael T.; assignor to Interchemical Corp., New York, N.Y. (pat.)
U.S. Patent 3,614,806 (October 26, 1971)

The machine is used to cut crab bodies into half sections. FTP

2.3 APPARATUS FOR CUTTING CRAB BODIES

Lockerby, W. Lee (Houston, TX 77015) (pat.)
U.S. Patent 3,611,478 (October 12, 1971)

2.01 (0.5)

two species of Pseudomonas, one species of Bacillus, and a coryneform bacterium inhibited the formation of melanin pigment in the shrimp juice, but only the Pseudomonas species inhibited melanin formation on the shrimp meats.
[2 figures, 4 tables, 28 references] FTP

This jellied fish-meat product contains wheat gluten, a reducing agent (to cleave intermolecular S-S linkages), a coagulant, a nitrate salt, and a carboxymethyl stabilizer. FTP

2.06 JELLIED FISH PRODUCT
(3.11)(6.54)

Chiga Seifun Co. Ltd. (pat.)
Japanese Patent 18586/71
Food Technology 25, No. 11, 118 (November 1971)

Meat of cutlefish is soaked in a seasoning solution and then is baked. The baked cutlefish is cut into strips and coated with a composition containing cheese. FTP

2.06 CUTTLEFISH PRODUCT

Ezaki Shoten K.K. (pat.)
Japanese Patent 16939/71
Food Technology 25, No. 11, 118 (November 1971)

2.1113 MICROBIAL DAMAGE TO MONOFILAMENT NETS
(0.5)

Von Brandt, A. (Institut für Fangtechnik der Bundesforschungsanstalt für Fischerei, Hamburg, Germany)
Archiv für Fischereiwissenschaft 21, No. 3, 232-237 (December 1970)

Changes in the properties of synthetic yarns can be caused by microorganisms. FTP
[6 figures, 5 references]

2.3 SCALLOP EVISCERATOR

Bunnell, Charles Milton (St. Augustine, FL 32084) (pat.)
U.S. Patent 3,621,515
Official Gazette of the U.S. Patent Office 892, No. 4, 1222 (November 23, 1971)

The invention relates generally to the processing of scallops and specifically to improvements in the eviscerator. FTP

2.3 FISH BLEACHING PROCESS

Ajinomoto Inc. (pat.)
Japanese Patent 18585/71
Food Technology 25, No. 11, 118 (November 1971)

Fish meat is blanched in an aqueous solution containing metal-chelating agents. This treatment minimizes phosphatase activity and causes the meat to swell, thereby facilitating the removal of blood. FTP

2.8 (0.5) DESTRUCTION OF SALMONELLAE BY MICROWAVE HEATING OF FISH WITH IMPLICATIONS FOR FISH PRODUCTS

Baldwin, Ruth E., M. L. Fields, William C. Poon, and Bernice Korschgen (Department of Food Science and Nutrition, University of Missouri, Columbia, MO 65201)
Journal of Milk and Food Technology 34, No. 10, 467-470 (October 1971)

This work consisted of the examination of the adequacy of microwave heating for destruction of salmonellae inoculated on the surface of fish. Also, the time and temperature relationships during microwave heating of certain fish products were determined in order to evaluate the effectiveness of this process for the destruction of salmonellae in certain prepared fishery food products.

Exposure of 270 g. pieces of carp to microwaves (2450 MHz) for 195 sec. was not adequate to completely destroy all the Salmonella typhimurium ATCC 6994 or the S. typhimurium ATCC 13311 inoculated on the surface of the pieces of fish.

One-serving size portions of tuna pies, tuna casseroles, fish fillets, and fish sticks required from 49 sec. to 390 sec. to reach the temperature of 55° C. (The lethal temperature for the salmonellae) when heated by microwaves. (Under normal use of microwave ranges, one-serving size portions would not be heated for as long as 390 sec.)

[2 figures, 1 table, 13 references] FTP

3.249 (9.16) STORAGE STABILITY OF COMMERCIALLY PREPARED AND FROZEN POND-RAISED CHANNEL CATFISH (ICTALURUS PUNCTATUS, RAFINISQUE)

Boggess, T. S., Jr., E. K. Heaton, and A. L. Shewfelt (University of Georgia, College of Agriculture Experiment Stations, Georgia Station, Experiment, GA 30212)
Journal of Food Science 36, No. 7, 969-973 (November-December 1971)

The purpose of this study was to determine the storage quality of samples of frozen pond-raised channel catfish from five commercial processing plants. Three distinct types of processing treatment were involved in the five sets of samples. The samples were stored at a temperature no higher than -10° F.; they were examined at regular intervals during the storage period of 270 days. The tests and examinations consisted of: moisture content, pH, fat stability (TBA value), shear press values of the raw fish, and sensory ratings for appearance, aroma, color, texture, and flavor of the cooked samples.

The storage behavior of the frozen pond-raised channel catfish is influenced substantially by the characteristics of the fresh fish, and by the practices used in handling and processing the product. Fish samples that were skinned and samples that were slow frozen showed increased moisture loss on frozen storage. The rates of decrease in quality were caused in part by variations in the methods of skinning and freezing. Certain developments in the aroma and flavor of the catfish were attributed to the conditions of the ponds during the production of the fish. [7 tables, 18 references] FTP

3.11 EFFECT OF EDTA ON THE GERMINATION OF AND OUTGROWTH FROM SPORES OF CLOSTRIDIUM BOTULINUM 62-A

Winarno, F. G., C. R. Stumbo, and K. M. Hayes (Department of Food Science and Technology, University of Massachusetts, Amherst, MA 01002)
Journal of Food Science 36, No. 5, 781-785 (July-August 1971)

Most low-acid canned foods are heat processed sufficiently to free them of spores of the botulinum organisms. However, certain food items, for various reasons (e.g. quality), cannot be given the severe heat treatment sufficient to eliminate the heat resistant spores of types A and B. Such products must be refrigerated or must be treated with bacterial inhibitors. The purpose of the present study was to determine the effect of EDTA, ethylenediaminetetraacetic acid, (a bacterial inhibitor) on the germination of and the outgrowth from spores of Clostridium botulinum type A. For these tests, pork infusion agar, polypeptone agar, and polypeptone broth were chosen as representative media for optimal growth of the organism; fish flesh (homogenated) was chosen as representative of low-acid food products.

Germination of and outgrowth from spores of C. botulinum type A and production of toxin was inhibited in a fish homogenate containing 5.0 (or above) mM of EDTA per liter of fish homogenate (1 part fish flesh and 2 parts distilled water). The inhibitory action of EDTA was influenced by the pH of the medium in the range of pH 6.5 to 8.1; the inhibitory action increased with increasing pH values within the range. The inhibitory effect of EDTA was also influenced by the cation content

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3.238 (2.43)(9.19) PLASTIC PACKAGES AND THE ENVIRONMENT

Thomka, L. M. (Packaging Department, Dow Chemical Co., Midland, MI 48604)
Journal of Milk and Food Technology 34, No. 10, 485-491 (October 1971)

The author states that, contrary to popular belief and current publicity, most plastics do make good packaging material when evaluated relative to their disposability and environmental effects. Thermoplastics are remeltable and can be recycled by existing methods to other plastic products. Furthermore, because they consist of mainly carbon and hydrogen and have a high energy content, thermoplastics are especially suitable for disposal in municipal incinerators for drying trash and generating power. They are not biodegradable, but they do degrade when exposed to outdoor weathering, and they are suitable and stable landfill materials. The foregoing benefits along with consumer appeal, sanitary nature, light weight, and protection afforded by plastics must all be considered when evaluating packaging materials. [8 figures, 14 references] FTP

3.12 POLYPHOSPHATES IN PROCESSING OF CURED MEATS

Gordon, A.
Food Manufacture 46, No. 10, 63-64 (October 1971)

The author describes, briefly, the use of certain polyphosphate products in the curing of meats. FTP

3.11

of the medium; equimolar concentrations of added $CaCl_2$ or $MgCl_2$ completely canceled the inhibitory action of EDTA. Also, the higher the spore concentration in the medium, the higher the concentration of EDTA required for inhibition. No evidence was found that EDTA, in any concentration used, promoted spore germination. [4 figures, 5 tables, 8 references] FTP

3.3 A CONDENSED HISTORY OF THE SCIENCE AND TECHNOLOGY OF THERMAL PROCESSING--PART 1

Goldblith, Samuel A. (Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, MA 02139)
Food Technology 25, No. 12, 44-46, 48-50 (1256-1258, 1260-1262) (December 1971)

This article is a history of the development of canning in terms of science and technology, relating the developments to the social fabric of our times. [3 figures, 28 references] FTP

3.33 RETORTING PROCEDURES (0.8)

Hughes, P. (Taylor Instrument Companies (Europe) Ltd.)
Food Manufacture 46, No. 11, 23-24, 26 (November 1971)

This is the first article of three devoted to the retorting process. The author discusses briefly the operations that take place during steam processing and during hot water processing. Three graphs are given showing the cooking retort temperature versus the pressure cycle (1) when the steam valve is too large, (2) when there is inefficient venting and early opening of the cooling water valve, and (3) when the correct cooking cycle is used for a typical retort. FTP [4 figures]

3.12 ON THE PRESERVING EFFECT OF SODIUM FORMATE

Scheer, H. (Institut für Biochemie und Technologie der Bundesforschungsanstalt für Fischerei, Hamburg, Germany)
Archiv für Fischereiwissenschaft 22, No. 1, 79-84 (June 1971)

Sodium formate was ineffective as a preservative of cod tissue and German caviar. [5 tables] FTP

3.12 PRESERVATION OF FISH FILLET

Courtial, Wolfgang (Farbwerke Hoechst A.-G.)
German Offen. (Patent) 1,914,639 (Nov. 12, 1970)
Chemical Abstracts 75, No. 7, 47656g (August 16, 1971)

2.43 (3.238) PACKAGES AND PACKAGING MATERIAL FOR FISH

Anonymous
Organization for Economic Cooperation and Development Publication No. 27,233, 95 pp. (1970) (In English and in French) (OECD Publications, 2, rue André-Pascal, Paris 16e, France)
World Fisheries Abstracts 22, No. 3, 27 (Abstract No. 22-3271) (July-September 1971)

This booklet is a review of the situation (through 1968) in Western Europe relative to the different types of containers and packages used for the handling, transport, and distribution of fish. It is divided into 6 parts: (1) Returnable fish boxes, (2) Nonreturnable fish boxes, (3) Prepackaged wet fish, (4) Packaging of frozen fish, (5) Edible coatings, and (6) Properties of plastic films used in packaging. (Abstract in WFA modified by FTP)

3.11 (6.54) FISH PASTE

Chiyodakagakukogyosho K.K. (pat.)
Japanese Patent 17938/71
Food Technology 25, No. 11, 118 (November 1971)

Fish paste products are treated with bromate, chlorate, or persulfate salts. FTP

3.2499 (0.38)(7.9) [INFLUENCE OF FREEZING AND THAWING OF CARP ON THE SUBCELLULAR DISTRIBUTION OF ASPARTATE AMINOTRANSFERASE IN THE SKELETAL MUSCLE] EINFLUSS DES GEFRIERENS UND AUFTANENS VON KARPFEN AUF DIE SUBZELLULÄRE VERTEILUNG DER ASPARTAT-AMINOTRANSFERASE IM SKELETMUSKEL

Hamm, Reiner, and Djurdjica Masic (Institut für Chemie und Physik der Bundesanstalt für Fleischforschung, Kulmbach, Germany)
Archiv für Fischereiwissenschaft 22, No. 2, 121-129 (October 1971) (In German)

Light carp muscle, excised immediately post mortem, results in damage of muscle mitochondria (caused by a high rate of breakdown of adenosine triphosphate). The authors reached this conclusion on the basis of some release of the mitochondrial isozymes of aspartate aminotransferase (glutamic-oxalacetic transaminase, GOT) into the sarcoplasma (muscle press-juice) and from the determination of ATP and its metabolites. Whole fish stored at 4° C. for 48 hr. post mortem showed only a little release of mitochondrial GOT.

Light carp muscle frozen at -20° C. and thawed and light carp muscle held in frozen-storage for 3 months do not show any remarkable change in total GOT activity of the tissue. However, light carp muscle held in frozen-storage for 6 months shows a large drop in total GOT activity. The muscle press-juice from frozen and thawed carp muscle shows a considerable increase in total GOT activity. The authors state that this effect is caused by a partial release of the three mitochondrial isozymes from the mitochondrial membranes into the sarcoplasma. Freezing causes damage to mitochondria. The authors proposed a routine test for differentiating between nonfrozen and frozen and thawed fish.
[3 figures, 6 tables, 9 references] FTP

4. REVIEW [LIPIDS]

Authors as listed below
Journal of the Japan Oil Chemists' Society 20, No. 10, 2-151 [612-761] (October 1971) (In Japanese)
Card A

This issue of the Journal is a review of the various aspects of the chemistry and biochemistry of lipids. The various articles are listed below.

"Separation and Identification of Lipids," by Tarō Hori and Osamu Itaskak (Department of Chemistry, Shiga University, Ishiyama-Hirazu, Otsu, Shiga-ken, Japan) pp. 2-16 [612-626]. [18 figures, 8 tables, 66 references]

"Biosynthesis of Lipid," by Yasuhiko Fujino (Department of Agricultural Chemistry, Obihiro Chikusan University, Inada-cho, Obihiro, Hokkaido, Japan) pp. 17-26. [627-636]. [15 figures, 13 references]

"Absorption and Transport of Fat," by Yasuo Akanuma (The Third Department of Internal Medicine, University of Tokyo 7-3-1, Hongo, Bunkyo-ku, Tokyo, Japan) pp. 27-31 [637-641] [3 figures, 1 table, 25 references]

"Lipids and Hormones," by Masami Nakamura (The Third Department of Internal Medicine) pp. 32-40 [642-650]. [7 figures, 1 table, 82 references]

"Lipids and Membrane Structure," by Osamu Hirayama (College of Agriculture, Shimane University, 1060 Nishikawatsu-chō, Matsue-shi, Japan) pp. 41-47 [651-657]. [7 figures, 1 table, 55 references]

"Immunology of Lipids," by Ichirō Hara (Tokyo Medical and Dental University, Kōnodai, Ichikawa, Japan) pp. 48-52 [658-662]. [15 references]

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4.14 DIFFERENCES IN THE FATTY ACID COMPOSITIONS OF BLUBBER FATS FROM NORTHWESTERN ATLANTIC FINWHALES (BALAENOPTERA PHYSALUS) AND HARP SEALS (PAGOPHILUS GROENLANDICA)

Ackman, R. G., S. Epstein, and C. A. Eaton (Halifax Laboratory, Fisheries Research Board of Canada, Halifax, Nova Scotia, Canada)
Comparative Biochemistry and Physiology 40, No. 3B, 683-697 (November 15, 1971)

Whales (Cetacea) and seals (Pinnipedia) deposit subcutaneous fat layers which act as insulation and depot fat, and probably have other functions such as reducing the resistance of the animal to the flow of water during swimming. In an attempt to discriminate between dietary and other factors affecting fatty acid compositions of blubber fats of these mammals, the authors examined the fatty acid composition of oil extracted from the blubber of one finwhale, of three commercial finwhale oils, and of three commercial harp seal oils.

The difference in composition of the saturated fatty acids among the fats were not significant, but the proportion of saturated fatty acids in the whale oil was higher than that in seal oils.

The results confirmed that 16:1 > 16:0 is typical of seal blubber; furthermore, details of isomers showed that the 16:1 $\omega 7$ is extended to 18:1 $\omega 7$ and 20:1 $\omega 7$, and suggested that 18:1 $\omega 9$ is extended to 20:1 $\omega 9$.

The authors propose that the seals, but not the whales, degrade a substantial part of ingested fatty acids to resynthesize 16:1.
[4 tables, 56 references] FTP

4. REVIEW [LIPIDS]

Authors as listed below
Journal of the Japan Oil Chemists' Society 20, No. 10, 2-151 [612-761] (October 1971) (In Japanese)

Card B

"Blood Lipids," by Tamotsu Taketomi (Institute of Adaptation Medicine, Shinshu University, Matsumoto-shi, Nagano-ken, Japan) pp. 127-134 [737-744]. [7 figures, 9 tables, 33 references]

"The Lipids of Brain and Nerve," by Kōhei Hayashi (School of Medicine, Gunma University, Showa-machi, Maebashi-shi, Japan) pp. 135-144 [745-754]. [11 figures, 2 tables, 67 references]

"Liver Lipids," by Toshio Sakagami (Sapporo Medical College, South 1, West 17, Sapporo, Japan) pp. 145-151 [755-761]. [8 tables, 51 references]

FTP

4.5 EFFECT OF HEME COMPOUNDS ON LIPID OXIDATION (0.30)

Hirano, Y., and H. S. Olcott (Department of Nutritional Sciences, Institute of Marine Resources, University of California, Berkeley, Calif. 94720)
Journal of the American Oil Chemists' Society 48, No. 10, 523-524 (October 1971)

The authors used a polarographic oxygen analyzer to study the effect of heme compounds on oxidation rates of linoleate emulsion systems. They found that the rate of oxidation of linoleate solutions was catalyzed by low concentrations of heme and heme-proteins and inhibited by higher concentrations. Also, high concentrations of these compounds inhibited lipoxygenase catalysis of linoleate oxidation. Salts of manganese and cobalt inhibited heme-catalyzed linoleate oxidation. The authors state that these combined effects may reflect the oxidative synthesis of antioxidants from heme compounds.
[5 figures, 7 references] FTP

4.13 CONJUGATED LIPIDS OF THE RED SALMON KIDNEY (LIPIDS OF SALMONOID FISHES XI)

Ogawa, Akira, Kotichi Zama, and Hisnano Igarashi (Laboratory of Food Chemistry, Faculty of Fisheries, Hokkaido University, Hakodate, Japan)
Bulletin of the Faculty of Fisheries Hokkaido University 22, No. 2, 159-167 (August 1971) (In Japanese)
[3 figures, 6 tables, 25 references]

4.21 ACID COMPOSITION OF THE NONOXIDIZED FRACTION SEPARATED FROM OXIDIZED OIL

Sawicki, Jan, and Henryk Niewiadomski (Dep. Fat Chem. Technol., Gdansk Tech. Univ., Gdansk, Poland)
Chemical Abstracts 75, No. 9, 62331r (August 30, 1971)

4.13 MONOETHYLENIC FATTY ACIDS OF A PARTIALLY HYDROGENATED HERRING OIL

Ackman, R. G., S. N. Hooper, and J. Hingley (Halifax Laboratory, Fisheries Research Board of Canada, Halifax, Nova Scotia, Canada)
Journal of the American Oil Chemists' Society 48, No. 2, 804-806 (December 1971)

In Canada, hydrogenated marine oils have been used in margarines, shortenings, or cooking oils. Recent work has demonstrated certain physiological responses of animals to long chain (C_{20} and C_{22} monoethylenic fatty acids [J. E. Beare-Rogers, E. A. Nera, and H. A. Heggtveit, Can. Inst. Food Technol. J. 4, 120 (1971)]. The present article reports on the analysis of a partially hydrogenated herring oil used in a similar study [H. Brockerhoff and P. H. Odense, Fish. Res. Bd. Canada, Tech. Rept No. 229 (1970) and P. H. Odense and H. Brockerhoff, J. Fish. Res. Bd. Canada, in press].

The herring oil used in these tests had been hydrogenated for margarine use to an iodine value of 76 and a melting point of 32.5° C. The hydrogenated herring oil had 30% saturated acids and 66% monounsaturated fatty acids. The trans acids were 33% of the C_{16} and C_{18} monounsaturated acids, 32% of the C_{20} monounsaturated acids, and 28% of the C_{22} monounsaturated acids. The positions of the double bonds of the original cis fatty acids were largely retained in both cis and trans isomers, but, the authors indicate, additional isomers were observed, especially in the trans fatty acids. [1 table, 20 references] FTP

4.5 (0.03) OXIDATIONS INVOLVING THE HEME COMPLEX IN RAW MEAT

Greene, Barbara E. (School of Home Economics, University of Georgia, Athens, Ga. 30601)
Journal of the American Oil Chemists' Society 48, No. 11, 637-639 (November 1971)

Heme pigments can catalyze oxidation of tissue lipids causing a stale or rancid flavor and odor. Free radicals from lipid oxidation can oxidize and decompose the red ferrous hemes resulting in brown colored meat. In this article, the author discusses three approaches in the study of means of reducing these nonmicrobial oxidative changes: (1) enzymatic reduction of metmyoglobin to maintain ferrous pigments, (2) inhibition of pigment and lipid oxidation and decomposition by means of an antioxidant and reducing agent, and (3) the use of model systems to study the kinetics of lipid and heme oxidations.
[1 figure, 1 table, 15 references] FTP

4.14 (0.35) THE BOTTLE-NOSED DOLPHIN TURSIOPS TRUNCATUS: FATTY ACID COMPOSITION OF MILK TRIGLYCERIDES

Ackman, R. G., C. A. Eaton (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia, Canada), and E. D. Mitchell (Fisheries Research Board of Canada, Arctic Biological Station, Ste. Anne de Bellevue, Quebec, Canada)
Canadian Journal of Biochemistry 49, No. 10, 1172-1174 (1971)

The triglycerides of the milk of the bottle-nosed dolphin correspond in fatty acid details to the composition of the depot fats of marine mammals generally.
[1 table, 14 references] FTP

4.

"Biochemistry of Branched Chain Fatty Acids," by Nobuo Ueta (Department of Biochemistry, University of Tokyo) pp. 53-59 [663-669]. [5 figures, 35 references]

"Desaturation and Chain-Elongation of Fatty Acids--Especially in Relation to the Nutritional Type of Organism and the Environmental Factors--," by Sūichi Kimura (Department of Food Chemistry, Faculty of Agriculture, Tohoku University, 1-1, Tsutsumi-dori-amemiya-machi, Sendai, Japan) pp. 60-67 [670-677]. [4 figures, 56 references]

"Bacterial Lipids," by Makoto Matsumoto and Masao Miwa (Shizuoka College of Pharmacy, 2-2-1 Oshika, Shizuoka-shi, Japan) pp. 68-76 [678-686]. [1 figure, 105 references]

"The Lipids of Yeasts," by Hiroshi Kaneko and Toshihiro Itoh (School of General Studies, Kitasato University, 1. Asamizodai, Sagamihara-shi, Kanagawa-ken, Japan) pp. 77-84 [687-694]. [6 figures, 3 tables, 79 references]

"Plant Lipids," by Masayuki Katayama (Department of Agricultural Chemistry, University of Osaka Prefecture, Sakai, Osaka, Japan) pp. 85-97 [695-707]. [4 figures, 11 tables, 101 references]

"Lipids of Seeds," by Manjirō Noda (College of Agriculture, Kyoto Prefectural University, Sakyo-ku, Kyoto, Japan) pp. 98-105 [708-715]. [1 figure, 4 tables, 62 references]

"The Lipids of Fish and Plankton," by Minoru Yamada (Faculty of Fisheries, Hokkaido University, Minato-machi, Hakodate, Japan) pp. 106-115 [716-725]. [4 tables, 63 references]

"Lipids of Shellfish," by Akira Hayashi (Faculty of Science and Technology, Kinki University 321, Kowakae, Higashiosaka, Osaka, Japan) pp. 116-126 [726-736]. [4 figures, 6 tables, 169 references]

[Continued on Card B]

4.92 TOXICOLOGICAL EXAMINATION BY CHICKEN EMBRYO ON RANCID OILS

Mura, Toshiyuki, Masako Tsuchida, and Kōmei Miyaki (National Institute of Health, Kamiosaki, Shinagawa-ku, Tokyo, Japan)
Journal of Japan Oil Chemists' Society 20, No. 6, 13-18 [335-340] (June 1971)

The authors propose the use of a chick embryo test for the evaluation of the toxicity of rancid oils. Using this test, they found that various fresh oils were nontoxic to chick embryos but rancid oils were toxic--the toxicity increased with higher degrees of rancidity of the oils. The abstract and the wording of the tables and figures of this article are in English, but the body of the report and most of the references are in Japanese.
[8 figures, 3 tables, 18 references] FTP

4.21 LIPID OXIDATION AND OXIDIZED OIL STAIN OF AQUATIC PRODUCTS

Toyomizu, Masamichi (Fac. Agr., Kyushu Univ., Fukuoka, Japan)
Chemical Abstracts 73, No. 23, 119249k (December 7, 1970)

4.21 LIPID OXIDATION AND OXIDIZED OIL STAIN OF AQUATIC PRODUCTS

Fujimoto, Kenshiro (Fac. Agr., Tohoku Univ., Sendai, Japan)
Chemical Abstracts 73, No. 23, 119250d (December 7, 1970)

6.190 THE INFLUENCE OF PARTIALLY DELACTOSED WHEY, FISH MEAL AND SUPPLEMENTAL BIOTIN IN BROILER DIETS

Damron, B. L., D. P. Eberst, and R. H. Harms (Florida Agricultural Experiment Station, Gainesville, FL 32601)
Poultry Science 50, No. 6, 1768-1771 (November 1971)

The purpose of this study was to determine the influence of partially delactosed whey, fish meal, and supplemental biotin, alone and in combination, on the growth and feed efficiency of broilers. The addition of either 3.0% fish meal, 1.5 or 3.0% partially delactosed whey, or 100 and 200 mg./ton of supplemental biotin to a commercial-type broiler diet did not result in a significant response from the broilers as measured by body weight or feed efficiency. However, when 100 or 200 mg./ton of biotin or 1.5 or 3.0% of whey were added to a diet containing the other material a significant growth response was indicated when the birds reached 4 weeks of age. [3 tables, 14 references] FTP

6.190 LIPIDS EXTRACTED FROM IMPORTED BROWN FISH MEAL (4.20)
Shimma, Yaichiro, and Hisako Shimma (Freshwater Fish. Res. Lab., Tokyo, Japan) Chemical Abstracts 75, No. 5, 34206k (August 2, 1971)

7.522 FRACTIONATION OF GOLDFISH BRAIN AMINOACYL-TRANSFER RNA AT THE MICROGRAM LEVEL

Kaplan, B. B., V. De Leŏn, and J. J. Sirlin (Department of Anatomy, Cornell University Medical College, New York, N.Y. 10021)
Journal of Neurochemistry 18, No. 6, 845-850 (June 1971) (Pergamon Press, Maxwell House, Fairview Park, Elmsford, N.Y. 10523)

The authors describe a simple, reproducible, chromatographic system that can be used to rapidly scan tRNAs extracted from limited amounts of biological material. It is a modified, scaled-down (by a factor of 100) version of the methylated albumin-kieselguhr column first used by Sueoka and Yamane (1962) to fractionate tRNA. With it, the authors were able to separate 1 µg. of tRNA from goldfish brain; and by double labeling co-chromatography they were able to characterize isoaccepting tRNAs without serious loss of resolution. Although they have not tried to fractionate less than 1 µg. of radioactive aminoacylated tRNA, they state that further scaling down seems to be feasible.
[4 figures, 23 references] LB

7.591 LOBSTER MUSCLE TRANSPEPTIDASE
Myhrman, Rolf, and Joyce Bruner-Lorand (Dep. Chem., Northwest Univ., Evanston, Ill.) Chemical Abstracts 75, No. 11, 71604j (September 13, 1971)

6.54 [DEVELOPMENT OF NEW FISH PROTEIN CONCENTRATES IN ARGENTINA. I. CHEMICAL BASIC COMPOSITION] ENTWICKLUNG NEUER FISCHMEHLE IN ARGENTINIEN. I. CHEMISCHE GRUNDZUSAMMENSETZUNG

Sotorres, Atilio M., Niels A. Suldrup, and Elsa L. Itten de Entizne (Química Biologica, Departamento de Química e Ing. Química, Universidad Nacional del Sur, Bahía Blanca, Argentinien)
Archiv für Fischereiwissenschaft 22, No. 2, 130-135 (October 1971) (In German)

The proximate composition and amino-acid content of several fish protein concentrates (prepared from various fishes caught near Bahía Blanca, Argentina) are given in this article. The basic composition and amino-acid content of the protein concentrates were similar. The authors considered the various fish protein concentrates suitable for human consumption.
[3 tables, 12 references] FTP

6.54 NUTRITIVE VALUE OF FISH PROTEIN CONCENTRATE
Makdani, Dhiraj Lal D. (Michigan State Univ., East Lansing, Mich.) Chemical Abstracts 75, No. 15, 96081z (October 11, 1971)

7.592 METHOD OF DETERMINING CAROTENOID CONTENTS OF ALASKA PINK SHRIMP AND REPRESENTATIVE VALUES FOR SEVERAL SHRIMP PRODUCTS

Kelley, Carolyn E., and Anthony W. Harmon (Fishery Products Technology Laboratory, National Marine Fisheries Service, NOAA, U.S. Department of Commerce, Kodiak, AK 99615)
Fishery Bulletin 70, No. 1, 111-113 (January 1972)

The carotenoid in Alaska pink shrimp is primarily astaxanthin. The content of carotenoid in Alaska pink shrimp varies with the season of the year and with the different areas in which the shrimp are caught. The carotenoid content may correlate with the quality of the shrimp and as such may be useful as a index of quality.

The method of analysis described in this article measures total astaxanthin and its oxidation product astacin. The method is a modification of the one developed by Elinor Ravesi in 1965 (Unpublished manuscript filed at the present authors' laboratory in Kodiak). The original method had to be modified because shrimp meat contains more interfering protein and moisture than does crab meat.

The modified method for determining carotenoid content of Alaska pink shrimp is simple and precise and may be used on a variety of shrimp products. The carotenoid index value for raw Alaska pink shrimp tails was 0.267 and the value for the machine-peeled canned shrimp was 0.059.
[1 table, 3 references] FTP

7.52 QUANTITATIVE ULTRAMICROANALYSIS OF AMINO ACIDS IN THE FORM OF THEIR DNS-DERIVATIVES. 3. ANALYSIS OF NATURAL AMINO ACIDS. CHARACTERISTICS OF THE METHOD

Spivak, V. A., V. A. Fedoseev, V. M. Orlov, and JA. M. Varshavsky (Institute of Molecular Biology of the U.S.S.R. Academy of Sciences, Moscow B-312, and Institute of Genetics and Selection of Industrial Microorganisms, Moscow, U.S.S.R.)
Analytical Biochemistry 44, No. 1, 12-31 (November 1971)

This paper describes an ultramicromethod for the analysis of amino acids that has a sensitivity of 1×10^{-11} mole of amino acid, operating range of from 1×10^{-11} to 5×10^{-10} mole of amino acid in the initial mixture, and reproducibility (relative standard deviation) of 3-5%.
[4 figures, 4 tables, 39 references]
FTP

7.591 CHROMATOGRAPHIC BEHAVIORS OF PROTEOLYTIC ENZYMES IN CHUM SALMON PYLORIC CAECA ON SEPHADEX GEL CHROMATOGRAPHY

Uchida, Naoyuki (Laboratory of Biochemistry, Faculty of Fisheries, Hokkaido University, Hakodate, Japan)
Bulletin of the Faculty of Fisheries Hokkaido University 21, No. 4, 305-314 (February 1971)

Proteolytic enzymes from the pyloric caeca of chum salmon showed different chromatographic patterns on the Sephadex G-100 column (2.5×100 cm.) depending upon the buffers used. The author suggests that the Sephadex gel chromatography with a borate buffer would probably be one of the useful methods for purifying the proteolytic enzyme extracted from the pyloric caeca of chum salmon.
[8 figures, 9 references]
FTP

6.130 RECOVERY OF FISH OIL AND PROTEIN FROM FISH PROCESSING EFFLUENT

Kato, Kenji, and Shizuhiro Ishikawa (Kurita Genc. Lab., Kurita Water Ind., Ltd., Yokohama, Japan)
Chemical Abstracts 74, No. 18, 90696j (May 3, 1971)

Spray-dried whole fish meal and oil are prepared from whole fish.
FTP

6.89 STATUS OF THE PRECIOUS CORAL INDUSTRY IN JAPAN, TAIWAN, AND OKINAWA: 1970

Grigg, Richard W. (Hawaii Institute of Marine Biology, University of Hawaii, Honolulu, Hawaii)
University of Hawaii Sea Grant Program, Report No. UNIHI-SEAGRANT-AR-71-02, 14 pp. (November 1971) (Honolulu, Hawaii)

The University of Hawaii is conducting a study of the ecology of precious corals and the development of precious coral fisheries in Hawaii. One of the major goals for this program is to survey the existing coral jewelry industry, which currently is almost exclusively dependent on the Japanese market. This report describes the results of a three-week trip in the summer of 1970 to Japan, Taiwan, and Okinawa, where interviews with fishermen, merchants, and scientists were held. Information gathered included observations of vessels, gear, fishing technique, and coral jewel factories and data concerning the history of the fishery, location and depths of fishing grounds, ecology of various species, and catch and market statistics.
The term "precious coral" classically refers to the red corals of commerce. These species are all placed in the family Coralliidae, order Gorgonacea, subclass Octocoralliia, class Anthozoa, phylum Coelenterata. At present there are 20 species known to inhabit the Indo-Pacific, six of which occur in Hawaii and seven in Japan (Bayer, 1956). Species of commercial importance in the Orient include the red coral or aka-sango, Corallium japonicum and C. nobile, the pink coral or momoiro-sango, C. elatius, and the white coral or shiro-sango, C. konojoi.
[8 figures, 1 table, 3 references]
Author's introduction

6.54 FISH PROTEIN EXTRACTION

Kyokuyo Hogei Co. Ltd. (pat.)
Japanese Patent 21774/71
Food Technology 25, No. 12, 78 (1290) (December 1971)

Fine particles of fish flesh are extracted with a neutral salt solution. The extract is adjusted to pH 4.5 to 5.5 by the addition of salt to precipitate a protein for use as an additive in meat and fish pastes.
FTP

7.42 [DETERMINATION OF MERCURY IN TUNA USING THE ISOTOPIC DILUTION METHOD]
BESTIMMUNG VON QUECKSILBER IN THUNFISCH MIT HILFE DER ISOTOPENVERDÜNNUNGSANALYSE

Mundt, W., and W. Feldt (Isotopenlaboratorium der Bundesforschungsanstalt für Fischerei, Hamburg, Germany)
Archiv für Fischereiwissenschaft 22, No. 2, 136-145 (October 1971) (In German)

A method is described for the determination of mercury in tuna by means of atomic absorption spectroscopy.
[2 figures, 1 table, 15 references]
FTP

6.54 NUTRITIVE QUALITY OF WHEAT FLOUR AND BREAD SUPPLEMENTED WITH EITHER FISH PROTEIN CONCENTRATE OR LYSINE

Stillings, B. R., V. D. Sidwell, and O. A. Hammerle (Natl. Cent. Fish Protein Conc., Natl. Mar. Fish. Serv., College Park, Md.)
Chemical Abstracts 75, No. 13, 85928e (September 27, 1971)

6.54 AVAILABILITY IN MAN OF PROTEIN AND MINERALS FROM FISH PROTEIN CONCENTRATE

Spencer, Herta, Joseph Samachson, Josephine Fowler, and Mary J. Kulka (Metab. Sect., Veterans Adm. Hosp., Hines, Ill.)
Chemical Abstracts 74, No. 19, 96166k (May 10, 1971)

7.9 A NEW PROCEDURE FOR ISOLATING POULTRY AROMA ESSENCE

Nonaka, M. (Western Regional Research Laboratory, Agricultural Research Service, U.S. Department of Agriculture, Berkeley, Calif. 94710)
Food Technology 25, No. 11, 45-46, 48, 50 (November 1971)

The aroma essence from poultry meat is isolated by capturing the essence from the cooking vapors of the meat in di-n-butyl phthalate or extracting the essence from the broth of the cooked meat. The di-n-butyl phthalate selectively entrapped the volatile components so that the aroma essence had the main aroma characteristics of the original meat product. Entrapped in this manner, the essential volatile components are concentrated and remain stable. Also, the poultry meat aroma constituents can be removed easily and completely from the di-n-butyl phthalate by distillation and then used to fortify the flavor of many poultry products or to develop new products.
[1 figure, 1 table, 13 references] FTP

7.591 L-GLUTAMATE DEHYDROGENASE (DOGFISH LIVER AND CHICKEN LIVER)

Gorman, Leonard, and Arvind Inamdar (Sch. Med. Dent. Med., Tufts Univ., Boston, Mass.)
Chemical Abstracts 75, No. 13, 84562u (September 27, 1971)

8.8 FLAVORS AND ODORS OF FISH OILS
(4.)

Stansby, Maurice E. (Pioneer Research Laboratory, National Marine Fisheries Service, NOAA, 2725 Montlake Blvd. East, Seattle, WA 98102)
Journal of the American Oil Chemists' Society 48, No. 12, 820-823 (December 1971)

Off-odors and -flavors in fish oils arise from the presence of metabolites and of spoilage products of fish protein, and from oxidation products of the oil. The odor and flavor of the meat of animals fed excessive amounts of fish oil arise from the polyunsaturated components of the fish oil, rather than from the oxidation products of the oil or from the original flavor and odor of the oil. Refining of fish oil removes objectionable odors and flavors. Also, the objectionable odor and flavor of fish oils can be masked by use of certain additives.
[14 references] FTP

3.59 PHOSPHOGLUCOMUTASE POLYMORPHISM IN PACIFIC OCEAN PERCH, (9.125)(0.38) SEBASTODES ALUTUS (1.9)

Johnson, Allyn Gregory, Fred M. Utter, and Harold O. Hodgins (Biol. Lab., Natl. Mar. Fish. Serv., Seattle, Wash. 98102)
Chemical Abstracts 75, No. 7, 45991p (August 16, 1971)

9.10 THE NEED FOR ENVIRONMENTAL LABORATORIES

Kneafsey, Patrick (Environmental Services Division, Health and Social Services Department, State of New Mexico, Santa Fe, NM 87501) 01)
Journal of Milk and Food Technology 34, No. 11, 526-528 (November 1971)

The need to preserve the environment for future generations makes it essential that ecological laboratories be developed. The traditional laboratories are not suitably organized, equipped, or staffed to handle environmental and ecological problems. Furthermore, in the past, standards and control programs have been based on the concept of control feasilibity rather than the concept of environmental maintenance. An environmental laboratory should be based on the following concepts: (1) It must be based on "man in his environment." (2) It must be regional in scope. (3) It must have research capabilities in the fields of economics, sociology, political science, education, and the physical sciences. (4) Its services must be available to all agencies in the region involved with environmental problems. (5) Its prime mission must be not only to identify factors which result in environmental degradation but also to identify those components which make up a "quality environment." FTP

9.11 POLAROGRAPHY OF SEAWATER. II. COMPLEX FORMATION OF CADMIUM WITH EDTA

Maljković, Dubravka (Center for Marine Research, Institute "Rudjer Bošković, Zagreb, Yugoslavia), and Marko Branica (Faculty of Technology, University of Zagreb, Sisak Croatia)
Limnology and Oceanography 16, No. 5, 779-785 (September 1971)

Earlier work has shown that the uptake of Co, Mn, and Zn in mussels is decreased by EDTA (ethylenediaminetetraacetic acid). In the present work, the researchers studied the formation of a complex of cadmium and EDTA in sea water and in sodium chloride solution by means of square-wave polarography. The rate of formation of the Cd-EDTA complex in sea water is lower than that in a solution of sodium chloride or a solution of calcium and sodium chloride. The degree of complex formation of cadmium with EDTA (in the presence of chloride and calcium ions) is diminished by the formation of cadmium monochloro complex and by the competition between calcium and cadmium.
[6 figures, 1 table, 5 references] FTP

9.19 NEUTRON ACTIVATION ANALYSIS OF ENVIRONMENTAL CONTAMINATION AND DISTRIBUTION OF MERCURY IN ANIMALS AND FISH

Byrne, A. R., M. Dermelj, and L. Kosta (Jozef Stefan Inst., Ljubljana, Yugoslavia)
Chemical Abstracts 75, No. 17, 105937n (October 25, 1971)

9.10 PESTICIDES IN THE ENVIRONMENT, VOLUME 1, PART 1
(9.6)

White-Stevens, Robert (editor)
Published by Marcel Dekker, Inc., (n.d.) 270 pp. Price £11.20
Harold Egan (reviewer)
New Scientist 52, No. 773, 117 (December 9, 1971)

This is the first of two volumes which deal with pesticidal chemicals; they will be followed by three more concerned with the practical aspects of handling pesticides in the environment.

The present volume, in three chapters, is concerned with the properties and uses of pesticides. The first chapter, by Robert Metcalf, is concerned with the chemistry and biology of pesticides (fungicides, herbicides, insecticides, molluscacides, nematocides, rodenticides). The second chapter, by T. R. Fukuto and J. J. Sims, is concerned with insecticide metabolism in plants and animals, and includes a brief review of the literature on fungicide metabolism. The third chapter, by J. E. Loeffler and J. van Overbeek, deals with herbicide metabolism.

FTP

9.11 GENERAL CIRCULATION AND WATER CHARACTERISTICS IN THE SOUTHERN CALIFORNIA BIGHT

Jones, James H. (Southern California Coastal Water Research Project, 1100 Glendon Ave., Los Angeles, Calif. 90024)
Southern California Coastal Water Research Project Report, viii + 37 pp. (October 1971) Price $1.90.

The transport and fate of a substance introduced into the Southern California Bight is dependent upon the physical and chemical properties and circulation patterns of the coastal waters in the area. When available literature on these phenomena was analyzed and summarized, a coherent picture of the general features of offshore circulation in southern California and its seasonal variations emerged. However, the summary revealed that present knowledge on certain topics is insufficient for predicting the dispersion of a trace material entering the Bight. In particular, there is need for more information on the nature and causes of nearshore circulation, which is important in determining the residence time of a parcel of water of the half-life of a conservative substance in the Bight. Valid estimates of these parameters must await specialized field programs and dynamic models of the Bight's circulation, but an estimate of 2 to 3 months for the residence time is in reasonable agreement with the available information. A discussion of research on aperiodic natural fluctuations, which may affect local marine life or bring biota from other regions into the southern California area, shows that studies to date have focused on one or two isolated phenomena. To predict average conditions as well as maximum expected deviations in the Bight, a detailed survey of the available data on all such large-scale fluctuations is needed.
[17 figures, 192 references] Author's abstract

9.19 EFFECTS OF SHORT-TERM EXPOSURE OF LEUCISCUS RUTILUS TO PHENYLMERCURIC HYDROXIDE
(1.92)

Lindahl, Per E., and C. E. B. Hell (Inst. Zoophysiol. Uppsala, Sweden)
Chemical Abstracts 75, No. 3, 19124p (July 19, 1971)

7.599 METHYL YELLOW AS A SINGLE CHROMOGENIC REAGENT FOR THE THIN LAYER
(9.19) CHROMATOGRAPHIC DETECTION OF ORGANOPHOSPHORUS PESTICIDES AND THEIR BREAKDOWN PRODUCTS

Ragab, M. T. H. (Research Station, Canada Department of Agriculture, Nova Scotia, Canada)
Laboratory Practice 20, No. 6, 489-491 (June 1971)

The author describes a procedure for the rapid detection of organophosphorus pesticides on microplates coated with microcrystalline cellulose. The organophosphorus pesticides are made visible on the plates by exposing the developed thin layer plates to bromine and subsequently spraying them with methyl yellow. A table is given showing the response of 54 organophosphorus pesticides and breakdown products to methyl yellow chromogenic reagent.
[1 table, 12 references] FTP

9.10 THE LESSON OF THE ASKÖ LAB
(9.19)

Jamison, Andrew
New Scientist 52, No. 773, 78-80 (December 9, 1971)

A team of Swedish scientists (biologists, chemists-geologists) at the Askö laboratory are trying to develop a systematic model of the Baltic ecosystem in order to understand what pollution is doing to the Baltic. According to Bengt-Owe Jansson, Director of the Askö laboratory, the question involves the study of the inflow of organic material and other pollutants, along with the detailed interactions and interrelationships of the biological system, to develop a model that traces the flow of pollution and other energy sources through the sea. The model, simulated on a computer, hopefully would be able to predict changes in the system that could be expected to result from changes in one or another pollution input.

FTP

9.11 NOTE ON THE PROGRAMMING FOR OCEANOGRAPHIC DATA PROCESSING

Akiba, Yoshio (Laboratory of Oceanography and Meteorology, Faculty of Fisheries, Hokkaido University, Hakodate, Japan)
Bulletin of the Faculty of Fisheries Hokkaido University 21, No. 4, 299-304 (February 1971)

The author states that this proposed new computer program is more advantageous for processing oceanographic data than the Lagrange's method.

FTP
[3 figures, 3 tables, 2 references]

7.80 HYDRATION CAPACITY AS AN INDEX OF SHRIMP MICROBIAL QUALITY

Shelef, Leora A., and James M. Jay (Department of Biology, Wayne State University, Detroit, MI 48202)
Journal of Food Science 36, No. 7, 994-997 (November-December 1971)

The change in the hydration capacity of shrimp meat during storage at 5° C, was determined in an attempt to develop an index of microbial quality for shrimp based on these hydration capacity values. The samples of stored shrimp were tested at 24- to 48-hr. intervals for: total bacterial count, pH, water holding capacity, extract-release volume, viscosity value, and swelling value. The extract-release volume values seemed to offer a suitable index for detecting incipient spoilage of shrimp but further data are needed to firmly establish the relationship.

FTP
[6 figures, 3 tables, 6 references]

9.11 (2.12) SHIP'S INFLUENCE ON SURFACE AND RAWINSONDE TEMPERATURES DURING BOMEX

Wisner, Warren M. (State Climatologist for Missouri)
NOAA Technical Memorandum ERL BOMAP-6 (June 1971) Available from the National Technical Information Service, U.S. Department of Commerce, Sills Bldg., Springfield, Va. 22151; Order No. COM-71-00950.
NOAA Publications Announcement No. 71-77, 10, Item 71-17-18-01 (October 1971)

The Barbados Oceanographic and Meteorological Experiment (BOMEX), conducted in the summer of 1969, provided an opportunity to examine the representativeness of data on sea-air interaction processes obtained from a variety of sensors. This paper presents a comparative analysis of observations made from conventional facilities located amidships on five fixed ships with data obtained from instruments mounted on a boom extending forward from the bow of each ship. Results based on temperature recordings indicate that the boom measurements probably are more reliable when the relative wind blows off the sea past the boom and then over the ship. When the wind off the sea blows over the ship and then over the boom, however, ship's influence is such that the boom and shipboard instrumentation provide equally reliable measurements. (Author abstract, mod. by SK) Reprinted

9.12 THE ORIGINS OF TAXONOMY

Raven, Peter H. (Washington University, St. Louis, MO 63130), Brent Berlin, and Dennis E. Breedlove
Science 174, No. 4015, 1210-1213 (December 17, 1971)

Only about 10 to 15% of the approximately 10 million kinds of organisms in the world have been described at some level. Because of the rapid growth of the human population, most of the remainder will disappear from the earth before they are seen by a taxonomist. Furthermore, for more than 99% of the species that have been described, we know only a few morphological facts and one to several locations where they occur. The authors believe that these facts suggest a more rigorous application of priorities in systematic biology and a careful review of the principles upon which our taxonomic system is based.

Problems with the taxonomic system arise from the fact that it is not designed for information retrieval. In folk taxonomies, names are given to organisms and are used to communicate about the organisms with other persons who already know the culturally significant properties of the organisms being discussed. With modern electronic data processing equipment, information about organisms can be recorded, retained in a data bank, and then used for various purposes including the construction of various taxonomic systems. By using data processing equipment to its full potentialities, we should achieve a qualitative improvement in our perception of the living world. [14 references] FTP

9.125 THE EFFECT OF TAGGING UPON THE FATTY ACID METABOLISM OF JUVENILE PINK SALMON

Saddler, James B., and Rick Cardwell (Fisheries Research Institute, College of Fisheries, University of Washington, Seattle, Wash. 98105)
Comparative Biochemistry and Physiology 39, No. 4A, 709-721 (August 1, 1971)

One method of studying migration patterns, stock identity, and oceanic growth rates of salmon is by tagging. Yet the tag or stress (such as handling, confinement, anesthesia) inherent in the tagging operation may affect the salmon's behavior, feeding habits, and susceptibility to predation and disease. In this report, the effects of the Dennison internal anchor tag on the mortality and physical condition and on the qualitative and quantitative lipid changes in tagged and untagged pink salmon (Oncorhynchus gorbuscha) are shown.

Wild juvenile pink salmon were caught at sea and separated into two groups. Except for application of the Dennison tag, fish in the two groups were treated and handled alike. During the first 17 days of holding, 2 (3.6%) of the 55 untagged salmon died and 14 (26.9%) of the tagged ones died. Differences in mortality were significant at the 95% confidence level (as tested by chi-square analysis). Average weight of the untagged fish, though slightly higher than that of the tagged fish, was not statistically different. Although total body weight of the tagged fish was lower, their total liver weight was about 28% higher; the lipid content of their liver was almost double. After 20 days' holding, the lipid content of the muscle of tagged fish was 20% lower than that of the untagged fish; 12 days later the proportion of muscle fat in the tagged fish increased slightly. Specific fatty acids mobilized extensively from muscle to liver tissue in the (over)

9.13 LIPIDS OF MASU SALMON (ONCORHYNCHUS MASOU). I. VARIATIONS OF THE LIPID CONTENT AND THE FATTY ACID COMPOSITION OF JUVENILE MASU SALMON DURING THE PERIOD OF SMOLT-TRANSFORMATION, AND ON THE INFLUENCE OF LIGHT UPON THOSE VARIATIONS

Ōta, Tōru, and Minoru Yamada (Laboratory of Chemistry of Fish Oil, Faculty of Fisheries, Hokkaido University, Hakodate, Japan)
Bulletin of the Faculty of Fisheries Hokkaido University 22, No. 2, 151-158 (August 1971) (In Japanese; figures, tables, and abstract in English)

This work involved the examination of the variation of the lipid content of the muscle, and of the fatty acid composition of the muscle lipids, of cultivated juvenile Masu salmon during their smolt-transformation stage; also, the influence of light upon the variations was determined. The lipid content of the muscle of the control group [not exposed to light treatment] decreased rapidly during the period from the pre-smolt to the mid-smolt stage; the lipid content then remained about the same level during the period from the mid-smolt to the post-smolt stage. The lipid content of the muscle of the group exposed to light treatment remained constant during the pre-smolt and mid-smolt stages then decreased gradually during the period from the mid-smolt to the post-smolt stage. At the post-smolt stage, the lipid content of the muscle in the control group was higher than that in the illuminated group.

The level of total saturated and total monoenoic acids in the lipids of the muscle decreased during the period from the pre-smolt to the post-smolt stage; the rate of decrease of the total monoenoic acids was greater for the illuminated group than for the control group. [3 figures, 5 tables, 7 references] FTP

9.125

tagged salmon. All nine fatty acids in the muscle tissues were depleted, 22:6, 16:0, and 18:1 being reduced to the greatest extent; monounsaturated and saturated fatty acids were depleted most extensively. The significant mortalities following Dennison tagging substantiate the authors' conclusion that the changes in lipid metabolism are partial manifestations of a serious pathology. LB
[2 figures, 4 tables, 31 references]

9.13 (0.35) THE INCORPORATION OF RADIOACTIVE COMPOUNDS INTO THE AMERICAN LOBSTER HOMARUS AMERICANUS

Shieh, H. S. (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia, Canada)
International Journal of Biochemistry 2, 423-426 (1971) [Scientechnica (Publishers) Ltd.]

Live lobsters are able to synthesize glycerides from radioisotopically labeled precursors; there was incorporation of [U-14C]starch, [U-14C]glucose, [U-14C]pyruvate, sodium [U-14C]bicarbonate, [1,3-14C]glycerol, and [U-14C]glycerol phosphate into the glycerol moiety of lobster glycerides. Live lobsters also were able to incorporate various radioactive fatty acids into glycerides. The author states that the results suggest that the American lobster can synthesize triglycerides by the pathway via glycerophosphate and phosphatidic acid.
[3 tables, 23 references] FTP

9.13 (4,91) LIPID CATABOLISM IN FISH MUSCLE

Bilinski, E. (Fish. Res. Board Canada, Vancouver, British Columbia)
Chemical Abstracts 75, No. 21, 127160w (November 22, 1971)

9.13 COMBINED EFFECTS OF DIETARY LIPIDS AND ENVIRONMENTAL TEMPERATURE ON GROWTH, METABOLISM AND BODY COMPOSITION OF CHANNEL CATFISH (ICTALURUS PUNCTATUS)

Stickney, Robert R., and James W. Andrews (Skidaway Institute of Oceanography, 55 West Bluff Road, Savannah, Ga. 31406)
Journal of Nutrition 101, No. 12, 1703-1710 (December 1971)

A study of the interaction of five environmental temperatures (20, 24, 26, 30, and 33°), and three types of dietary lipids (beef tallow, safflower oil, and menhaden oil) on the growth and body composition of channel catfish, Ictalurus punctatus) indicated that maximum growth was obtained at 30° for fish fed each lipid supplement for a 70-day experimental period. At all temperatures, higher gains were obtained from beef tallow and menhaden oil than safflower oil supplements; likewise, lower food conversion rates were obtained from beef tallow and menhaden oil. The lipid level in fish carcasses increased with increasing temperatures up to 30° for all dietary supplements. At the optimum temperature for growth (30°), fish fed beef tallow contained less lipid than those fed the other supplements. The fatty acid composition of the diets was reflected in both liver and carcass lipids. [5 tables, 31 references] Authors' abstract

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9.11 (9.14) VERTICAL DISTRIBUTION OF THE OCEANIC ZOOPLANKTON

Vinogradov, M. E. (Akademiya Nauk SSSR, Institut Okeanologii, Izdatel'stvo, Moscow)
Translation TT 69-59015, 339 pp. (1970). Available from the National Technical Information Service, U.S. Department of Commerce, Sills Bldg., Springfield, Va. 22151.
NOAA Publications Announcement No. 71-77, 9, Item 71-17-16-24 (October 1971)

Discusses quantitative and qualitative aspects of oceanic plankton distribution in entire water column. Covers material from different parts of oceans as well as some marginal and Mediterranean seas with different physicochemical properties in deep and intermediate waters. Gives differences in plankton biomass with depth, inherent in subpolar and tropical waters. Author concludes that it is primarily the food supply which affects numerical distribution of meso- and macroplankton, depth changes in specific composition, and ecological, morphological, and biocenotic adaptations of deep [sic] (Author)
Reprinted

9.12 (0.5) LIGHT PRODUCTION IN THE LUMINOUS FISHES PHOTOBLEPHARON AND ANOMALOPS FROM THE BANDA ISLANDS

Haneda, Yata (Yokosuka City Museum, Yokosuka, Japan), and Frederick I. Tsuji (Department of Biophysics and Microbiology, University of Pittsburgh, and Veterans Hospital, Pittsburgh, Pa. 15213)
Science 173, No. 3992, 143-145 (July 9, 1971)

The shallow-water luminous fishes Photoblepharon and Anomalops were collected a short distance offshore of the Banda Islands at the eastern end of the Indonesian Archipelago. The authors suggested that the light organs of the fish contain symbiotic bacteria that produce light. They were not able to cultivate the bacteria; for this reason, and because of the morphology of the organisms, the authors further suggest that the bacteria are of a primitive type called bacteroids.
[2 figures, 18 references] FTP

9.16 NSF TRANSLATION OF JAPANESE MARICULTURE CLASSIC

Anonymous
American Fish Farmer and World Aquaculture News 2, No. 9, 13 (August 1971)

A translation of the 1,225-page book "Marine Aquaculture" by Tamura Tadashi (1966) is available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. The price is $15.00: Order No. PB-184051T. FTP

9.15 INFECTIOUS PANCREATIC NECROSIS IN RAINBOW TROUT IN SCOTLAND

Ball, H. J., A. L. S. Munro, A. Ellis, K. G. R. Elson (Marine Laboratory, Aberdeen Scotland), W. Hodgkiss (Torry Research Station, Aberdeen), and I. S. McFarlane (Highlands and Islands Development Board, Inverness)
Nature 234, No. 5329, 417-418 (December 17, 1971)

Infectious pancreatic necrosis was positively identified as causing an epizootic of rainbow trout fry (Salmo gairdneri) in a Scottish trout farm during February and March of 1971. Infectious pancreatic necrosis is a highly contagious viral disease of young trout, endemic in wild salmonids and some trout farms in the United States, and first recorded in Europe in 1965.
[2 figures, 9 references]
FTP

9.16 AQUACULTURE: A NEW ENGLAND PERSPECTIVE

Gaucher, Thomas A. (editor)
New England Marine Resources Information Program, 119 pp. (1971) Available from TRIGOM, 96 Falmouth St., Portland, ME 04103; and The New England Regional Commission, 55 Court St., Boston, MA 02108.

On October 21st-23rd, 1970, a workshop/conference "Aquaculture: The determinants of Success," was held at the New England Center for Continuing Education at Durham, New Hampshire. The Conference was planned and conducted by The Research Institute of the Gulf of Maine, and sponsored by the New England Regional Commission. The New England Marine Resources Information Program, a Sea Grant Program at the University of Rhode Island co-sponsored the report. The objective of the Conference was to consider and make recommendations on all the factors--legal, economic and technological--which must contribute to the success of commercial aquaculture. The contents of the report include:
"Conference Recommendations," by Donald B. Horton (Research Institute of the Gulf of Maine, 96 Falmouth St., Portland, ME 04103) pp. 1-6.
" A Technological Perspective," by Thomas A. Gaucher (Natural Resources Consultant, 188 East Ave., Westerly, RI 02891) pp. 7-21. [3 tables, 17 references, 1 appendix]
"An Economic Perspective," by John M. Gates (Department of Resource Economics, University of Rhode Island), and George C. Matthiessen (Marine Research Foundation Inc., P.O. Box 81, East Wareham, MA 02538) pp. 22-50. [1 figure, 54 references]
" A General Legal Perspective," by Harriet P. Henry (Attorney, 174 Prospect St., Portland, ME 04103) pp. 51-56.
(over)

9.16 POTENTIAL USES OF WASTE WATERS AND HEATED EFFLUENTS
(9.19)

Thorslund, Anders E. (Fishery Resources Division, Department of Fisheries, FAO, Rome, Italy)
EIFAC Occasional Paper No. 5, 23 pp. (September 1971) (European Inland Advisory Commission, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, Rome, Italy)

Considerable research is being carried out in Poland on the utilization of wastes (domestic, industrial, and heated effluents) for aquaculture, with the additional objective of controlling water pollution. Because FAO has considerable interest in promoting the production of fish and in combatting water pollution, the author spent about 2 weeks in Poland visiting several fishery research institutions to obtain information on how wastes are being used for fish production.
The information collected is reported in this article under three sections:
Section I. "The Use of Domestic Waste Water for Fish Culture in Poland." Crucian carp can be cultivated year-round in undiluted effluents from an activated sludge plant. Yields of fish greater than 1,000 kg./ha. were obtained without artificial feeding. [1 figure, 3 tables, 3 references]
Section II. "Treatment in Fish Ponds of Wastes From a Sugar Factory." Experimental data indicate that carp culture in sugar beet factory wastes is possible over a yearly cycle with good yields of fish (400-500 kg./ha.). [1 table, 5 references]
Section III. "Biological Control and Utilization of Heated Effluents, Konin Project." Polish scientists have carried out detailed studies on the biological effects of heated effluents on a system of five interconnected lakes in central
(over)

9.16 FISH TOXICANT COMPOSITIONS AND METHOD OF USING THEM

Berger, Bernard L.; assignor to the U.S.A. (Secretary of the Interior) (pat.)
U.S. Patent 3,608,072 (September 21, 1971)

Undesirable fish are killed by exposing them to a solution or dispersion of a mixture of antimycin A and naled (1,2-dibromo-2,2-dichloroethyl dimethyl phosphate).
FTP

9.16 SHRIMP CULTURE RESEARCH AT THE GALVESTON BIOLOGICAL LABORATORY

Neal, Richard A. (National Marine Fisheries Service, Biological Laboratory, Galveston, Tex.)
American Fish Farmer 2, No. 6, 5 pp. (May 1971)
Government Research Announcements 71, No. 20, 67 (October 25, 1971)

Three major problems have become apparent during the early experimental work designed to determine the feasibility of shrimp mariculture. Each problem--shrimp diseases, nutrition, and maturation--is discussed as well as ongoing and proposed research.
Abstract reprinted in part

9.15 NEMATOCYST TOXIN OF METRIDIUM

Goodwin, M. H., and M. Telford (Dep. Zool., Univ. Toronto, Toronto, Ontario, Canada)
Chemical Abstracts 75, No. 21, 127141a (November 22, 1971)

9.16 TECHNIQUES FOR RAISING PENAEID SHRIMP FROM THE EGG TO POSTLARVAE
(1.85)

Mock, Cornelius R., and M. Alice Murphy (Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.)
Proceedings of the First Annual Workshop, World Mariculture Society, Feb. 9-10, 1970, pp. 143-156
NOAA Publications Announcement No. 71-77, 9, Item 71-17-16-22 (October 1971)

Techniques for raising penaeid shrimp from the egg to postlarvae are discussed. Equipment, rearing methods, algal culture, collection of gravid females, spawning procedures, larval culture, and harvesting techniques are described step by step. (Author)
Reprinted

9.15 A PARASITE AND DISEASE SURVEY OF CONNECTICUT OYSTERS

Newman, Martin W. (National Marine Fisheries Service, Biological Laboratory, Oxford, MD 21654)
Pub. in Proceedings of the National Shellfisheries Association (1970) 61, 59-63 (June 1971) Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151; Order No. COM-71-00974.
Government Research Announcements 71, No. 22, 42 (November 25, 1971)

Histologic sections of 1,337 oysters, Crassostrea virginica, from New Haven Harbor, Connecticut, were examined for the presence of parasites and disease. Seven parasites were found, including types resembling plasmodia of Minchinia costalis and M. nelsoni.
Author's abstract in part

9.16 AQUATIC WEED CONTROL IN FISH PONDS WITH CHEMICAL METHODS

Lawrence, J. M. (Alabama Agricultural Experiment Station, Auburn, Ala.)
Paper presented at the World Symposium on Warm-Water Pond Fish Culture held in Rome, Italy, 15-16 May 1966, 13 pp. Available from the National Technical Information Service, Operations Division, Springfield, Va. 22151. Order No. AD-726 948; PC$3.00; MF$0.95.
Government Research Announcements 71, No. 17, 60 (September 10, 1971)

A listing of important algae genera and aquatic weed species, information on pond construction features of significance in aquatic weed control, and chemical control techniques are given. Data on fish toxicity and effective rates of application for use under pond conditions are presented for 2,4-D and silvex.
Author's abstract in part

9.16 NOTES ON THE RAISING OF AN ESTUARINE COPEPOD
(9.14)(1.89) GLADIOFERENS IMPARIPES THOMSON

Takano, Hideaki
Bulletin of the Tokai Regional Fisheries Research Laboratory No. 64, 81-88 (January 1971)

In a continuing attempt to find microcrustaceans that can be mass-cultured as food for carnivorous tank-raised fish, the author analyzed the food and life cycle of the calanoid copepod Gladioferens imparipes. This copepod was entirely herbviorous and could be fed exclusively on cultivated Phaeodactylum. The shortest period between generations was 15 days. The female could produce several broods at intervals of 2 or 3 days after mating only once. They all spawned and grew well in nondiluted sea water or in sea water diluted to half salinity. The minimum time they spend in each life stage is compared with that for Calanus finmarchicus, Tisbe sp., and Tigriopus japonicus.
[2 tables, 9 references]
LB

9.16 (9.19)

Poland that are used as a circulating cooling system for two baseload thermopower stations. The eutrophication of the lakes was used as a basis for the production of valuable quantities of fish (eel, common carp, and Chinese carps). Because of strict biological management, no adverse growth of aquatic plants or plankton occurred in the lake. [5 figures, 14 references]
FTP

9.16 ARTIFICIAL SEA WATER SOLUTION AND COMPOSITION
(9.11) FOR MAKING THE SAME

Kelley, William E. (Euclid, Ohio), and Vernon C. Goldizen (Cleveland Heights, Ohio) assignors to Aquarium Systems, Inc., Wickliffe, OH 44092 (pat.)
U.S. Patent 3,623,455
Official Gazette of the U.S. Patent Office 892, No. 5, 1680 (November 30, 1971)

The invention relates to an artificial sea-water solution, and a solid composition for making such a solution.
FTP

9.15 AN ANNOTATED LIST OF PROTOZOAN PARASITES, HYPERPARASITES,
(1.80) AND COMMENSALS OF DECAPOD CRUSTACEA

Sprague, Victor (Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. 20688), and John Couch (NOAA, National Marine Fisheries Service, Biological Laboratory, Oxford, Md. 21654)
Journal of Protozoology 18, No. 3, 526-537 (August 1971)

This principally taxonomic report is a systematic presentation of a complete list of the protozoa known to be associated with decapods. It deals with a few of the problems of generic and specific classification and nomenclature, suggests a few taxonomic changes, and mentions such matters as host, site of infection, geographic location, and pathogenicity. [218 references]
LB

9.16
"A Specific Legal Perspective: Florida," by Dorian Cowan (University of Miami School of Law, Coral Gables, FL 33146) pp. 57-70.
There are three appendices: (1) "Hatchery Design and Operation Information," by Ronald D. Mayo (Kramer, Chin and Mayo, 1917 First Ave., Seattle, WA 98101) pp. 71-83. [14 figures]; (2) "Useful References," pp. 84-106. [lists 78 publications and 63 selected references]; and (3) "Conference Notes."
Extracted by FTP

9.16 PRELIMINARY STUDIES OF SELECTED ENVIRONMENTAL AND NUTRITIONAL REQUIREMENTS FOR THE CULTURE OF PENAEID SHRIMP

Sick, Lowell V., James W. Andrews, and David B. White (Skidaway Institute of Oceanography, 55 West Bluff Road, Savannah, GA 31406)
Fishery Bulletin 70, No. 1, 101-109 (January 1972)

The harvest of commercial shrimp suffers great seasonal variability and has failed to keep pace with ever-increasing domestic and export demands. Several attempts have been made to culture shrimp in natural ponds, restricted portions of bays and estuaries, and laboratory tanks. In general, these efforts have had limited success and have explicitly illustrated the need for more accurately defining the nutritional and environmental requirements for culturing these species.

In the present study, an attempt was made to develop a suitable experimental culture system which could serve as a model for future nutritional and environmental studies. Several environmental factors were examined, and as a result, environmental conditions were created which would allow acceptable growth and survival. Having first established suitable culture conditions, several diets were evaluated in preliminary studies of the nutritional requirements of shrimp.
[3 figures, 2 tables, 18 references] Reprinted in part

Moseyich, M. V. (GosNIORKH, Leningrad, U.S.S.R.)
Chemical Abstracts 75, No. 22, 132381e (November 29, 1971)

9.16 ACTION OF SOME SALTS AND THEIR IONS ON SELF-PURIFICATION PROCESSES IN THE WATER OF FISH-HATCHERIES

9.19 (9.2) RESIDUALS MANAGEMENT IN THE PULP AND PAPER INDUSTRY

Bower, B. T., G. O. G. Lof (Resources of the Future, Washington, D.C.), and W. M. Hearon (Portland, Oreg.)
Natural Resources Journal 11, No. 4, 605-623 (October 1971)

In this paper, the authors describe and illustrate the major factors that affect residuals generation in the pulp and paper industry. The focus is on the major variables affecting generation of residuals in the production of paper in the pulp-paper mill and in converting to paper products. The emphasis is on the effects of: brightness as a product specification; processes for preparing pulp (groundwood, sulfite, sulfate, and repulped waste paper); and nature of raw material (wood types and waste paper). Some conclusions drawn from the analysis are as follows:

The simple knowledge that different mixes of residuals are generated by different production combinations is not sufficient for policy-making with respect to residuals management. The relative external costs resulting from discharge into the environment of different residuals must be determined.

Product specifications relate to residuals generation--for example, higher brightness, requiring more bleaching, adds to the generation of residuals and hence to costs of residuals management.

The reuse of paper residuals is not a panacea relative to managing the quality of the environment--the reuse of paper residuals requires processing that results in the generation of substantial quantities of residuals.
[14 footnotes] FTP

9.19 (8.42) MERCURY IN BRYOPHYTES (MOSS)

Yeaple, Donald S. (JBF Scientific Corporation, 2 Ray Ave., Burlington, MA 01803)
Nature 235, No. 5335, 229-230 (January 28, 1972)

Earlier work has demonstrated that certain mosses and lichens can concentrate heavy metals. If so, it is possible that this phenomenon might be used as a indicator of the transport of mercury through the atmosphere. In the present study, samples of mosses were collected to provide information on the level of mercury in moss around several types of populated areas. Data presented in this report (see following table) are from mosses collected within an 80-mile radius of Boston, Mass., along the Maine coast, near the tops of Mt. Katahdin in Maine and Mt. Washington in N.H., and from Walden, N.Y. (60 miles north of New York).

(over)

9.19 POLLUTION PARANOIA

Campbell, John W.
Anchor 5, No. 10, 412-420 (October 1971) (San Francisco Aquarium Society Inc., California Academy of Sciences, San Francisco, Calif. 94118)

Of the three types of pollution--actual, political, and hysterical--the agitation over mercury in canned tuna exemplifies both hysterical and political, but not actual, pollution. (This does not mean that excessive local concentrations of mercury are not causing actual pollution.) To solve the problems created by actual pollution, we need balance and judgment, not imbalance and insanity that make practical balances unattainable because of the hysterical demands of absolute elimination. LB

Harrison, Florence L. (Lawrence Radiat. Lab., Univ. California, Livermore, Calif.)
Chemical Abstracts 75, No. 5, 30880c (August 2, 1971)

9.19 BIOLOGICAL IMPLICATIONS OF NUCLEAR DEBRIS IN AQUATIC ECOSYSTEMS

9.19 (8.42)

Description of source of moss sample	Total mercury in moss sample	Description of source of moss sample	Total mercury in moss sample
	p.p.b.		p.p.b.
Large city	1,450	Suburb--source industry-2	935
Industrial suburb-1	1,320	Small industrial city	1,350
Industrial suburb-2	675	Medium size town concentrated in a small area	2,000
Residential suburb-1	250	Small coastal town-1	50
Residential suburb-2	330	Small coastal town-2	234
Suburb--some industry-1	910	Small coastal town-3	566
Rural area-1	286	Medium-sized coastal town	<50
Rural area-2	634	High, isolated mountain area-1	284
Residential suburb-3	465	High, isolated mountain area-2	<50

[1 table, 6 references] FTP

9.16 STOCKING DENSITY AND WATER REQUIREMENTS FOR HIGH-DENSITY CULTURE OF CHANNEL CATFISH IN TANKS OR RACEWAYS

Andrews, James W. (Skidaway Institute of Oceanography, Savannah, Ga.)
Feedstuffs 44, No. 6, 40-41 (February 7, 1972)

Channel catfish can be reared at densities of up to 8 lb. per cu. ft. of water (1 lb. of fish per gal. of water). During a 200-day experimental period, there was a gain of over 11 lb. per cu. ft. of water. Extrapolation of this growth rate curve data to a full 365-day growing period would give a production of over 20 lb. per cu. ft. of water. The food conversion ratio for the catfish was 1.6 (lb. gain per lb. feed). The author concludes that high density culture of catfish in tanks or raceways may be economical provided ideal environmental conditions and water temperatures can be maintained at low cost.
[4 figures, 5 tables, 11 references] FTP

9.19 HEAVY METAL CONCENTRATION IN COASTAL WATERS
(8.9)

Abdullah, M. I., L. G. Royle (Department of Oceanography, University of Liverpool), and A. W. Morris (Marine Science Laboratories, Menai Bridge, Anglesey, England)
Nature 235, No. 5334, 158-160 (January 21, 1972)

Data are presented on the general levels and distribution of some trace metals (Cu, Pb, Cd, and Zn) in surface waters of Liverpool Bay, Cardigan Bay, and the Bristol Channel. The areas selected contain regionally different effluents: Cardigan Bay is relatively free from industrial and domestic effluent; Liverpool Bay contains both domestic and industrial effluents; and Bristol Channel contains industrial and domestic effluent and runoff from a mineralized zone in north Devon. Data on average levels of the trace elements in the surface waters are shown in the following table.

Source of surface water sample	Value	Concentrations of trace metals			
		Cu	Pb	Cd	Zn
Liverpool Bay	Low	0.90	0.66	0.14	2.30
	Mean	1.45	1.74	0.27	11.86
	High	3.03	4.17	0.74	47.6
Cardigan Bay	Low	0.98	1.12	0.48	3.63
	Mean	1.72	2.24	1.11	7.46
	High	4.02	3.53	2.41	19.65
Bristol Channel	Low	1.02	0.35	0.28	3.57
	Mean	2.07	1.18	1.13	9.98
	High	4.74	5.06	4.20	21.42

Apparently, the distribution of trace metals in coastal waters is controlled by the amounts of the metals carried into and the circulation of the water in such environments. [1 figure, 1 table, 2 references]

FTP

9.19 ECOSYSTEM ANALYSIS: BIOME APPROACH TO ENVIRONMENTAL RESEARCH

Hammond, Allen L.
Science 175, No. 4017, 46-48 (January 7, 1972)

A better understanding of ecological systems than is now available is required to determine the long-range effects of manmade changes in the environment. Both basic theory and quantitative measurements of ecological changes are now lacking. As part of the United States participation in the International Biological Program, a major attempt is underway to understand how entire ecosystems function and, by modeling the behavior of these systems, to predict how the ecosystems will respond to manmade stresses. The author indicates that this ecosystem analysis program is having a major impact on the way many scientists perceive ecological problems and it is likely to produce some practical results that will aid in the management of natural resources.

More than 600 scientists (biologists, hydrologists, meteorologists) and engineers are participating in the ecosystem analysis program. The work constitutes the first attempt to conduct ecological research with large programs of directed research rather than with the traditional individual investigator. The study is being carried out on five biomes (habitat types)--grasslands, deciduous forests, coniferous forests, deserts, and arctic tundra. Plans are being made for research on another biome, tropical forests.

The author believes that the ecosystem analysis program may substantially improve man's ability to manage the environment and to predict long-term changes. Even if it does not do this, the training of a new type of ecologist seems certain to advance the attempt to understand ecological processes. [1 figure] FTP

9.16 THE CULTURE OF FOOD ORGANISMS FOR THE PRODUCTION OF EDIBLE MOLLUSCAN SEEDLINGS

Pyen, Choong Kyu, and Il Mann Shong
Bull. Fish. Res. Dev. Agency 6, (233-239) (1970)
Korean Scientific Abstracts 2, No. 4, Abstract No. 71/411, 117 (21) (August 1971)

Six species of marine algae were cultured in modified Hirano's and Umebayashi's solutions. Five algae were mentioned in the abstract: Chaetoceros simplex var. calcitrans, Monochrysis lutheri, Phaeodactylum tricornutum, Platymonas sp., and Skeletonema costatum. [9 figures, 2 tables, 8 references] Extractor: FTP

9.19 A DISCUSSION ON BIOLOGICAL EFFECTS OF POLLUTION IN THE SEA
(9.3)(7.43)(0.4)

Cole, H. A. (organizer)
Proceedings of the Royal Society London, Biological Sciences 177, No. 1048, 275-468 (April 13, 1971)

Card A

This entire issue of the journal is devoted to papers presented at the subject discussion. The meeting, which was held April 28 and 29, 1970, was divided into four sections, as shown below.

"Objectives of Biological Pollution Studies," by H. A. Cole (Fisheries Laboratory, Lowestoft, England); pp. 277-278.

I. Measurements of Pollution Effects on Living Organisms

"Bioassays To Determine Allowable Waste Concentrations in the Aquatic Environment," by C. M. Tarzwell (National Marine Water Quality Laboratory, Federal Water Quality Administration, Department of the Interior, West Kingston, R.I. 02892); pp. 279-285. [11 references]

"Techniques for Assessment of Pollution Effects on Seabirds," by I. Prestt (The Nature Conservancy, Monks Wood Experimental Station, Huntingdon); pp. 287-294. [34 references]

"Assessment of Pollution Effects by the Use of Algae," by Elsie M. Burrows (Hartley Botanical Laboratories, University of Liverpool, England); pp. 295-306. [5 figures, 22 references]

II. Sublethal Effects and Changes in Ecosystems

"Assessment of the Effects of Pollutants on Physiology and Behaviour," by

(over)

9.19 THERMAL DISCHARGES INTO THE COASTAL WATERS OF SOUTHERN CALIFORNIA

Young, Chen-Shyong (Southern Coastal Water Research Project, 1100 Glendon Ave., Los Angeles, Calif. 90024)
Southern California Coastal Water Research Project, vii + 30 pp. (October 1971) Price $2.00.

The coastal waters of southern California receive thermal energy from various man-induced inputs, including cooling waters from power plants and municipal and industrial waste effluent and associated oxidizable organic matter. Thermal energy is also absorbed naturally at the air-sea interface. An energy budget calculation is used to compare these inputs and show that the current man-induced thermal energy contribution (approximately 95×10^{10} Btu/day) to the coastal waters of the Southern California Mainland Shelf is about 0.6 percent of that naturally absorbed at the 1,400 sq mi of water surface. On the same broad-scale basis, the present man-made contribution is estimated to induce a temperature elevation of less than 0.2°F above the natural ambient temperature level. The total water surface area having a 2°F or higher temperature elevation as a result of powerplant thermal discharges alone is estimated to be between 3.6 and 7.5 sq mi, depending on the method of calculation, and this area can be considerably reduced by proper diffuser design.
[6 figures, 9 tables, 40 references] Author's abstract

9.19 A DISCUSSION ON BIOLOGICAL EFFECTS OF POLLUTION IN THE SEA
(9.3)(7.43)(0.4)

Cole, H. A. (organizer)
Proceedings of the Royal Society London, Biological Sciences 177, No. 1048, 275-468 (April 13, 1971)

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IV. Prevention and Monitoring

"Pollution Prevention," by E. L. Cronin (Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. 20688); pp. 439-450. [5 tables, 15 references]

"Monitoring the Marine Environment," by A. Preston and P. C. Wood (Ministry of Agriculture, Fisheries and Food, Radiobiological Laboratory, Lowestoft, and Fisheries Laboratory, Burnham-on-Crouch, England); pp. 451-462 [1 figure, 1 table, 11 references]

"Future Research Needs," by R. W. Edwards (The University of Wales Institute of Science and Technology, King Edward VII Avenue, Cathays Park, Cardiff, U.K.); pp. 463-468. LB

9.19 DDT RESIDUES IN EIGHT CALIFORNIA MARINE FISHES
(8.9)

Shaw, Stanton B. (Hopkins Marine Station, Stanford University, Pacific Grove, CA 93950)
California Fish and Game 58, No. 1, 22-26 (January 1972)

Levels of DDT, DDD, DDE, and total DDT residues in the livers and flesh of marine fishes, mainly from Monterey Bay, were determined using gas-liquid chromatography. Mean values for total DDT residues for liver ranged from 4.7 ppm wet weight (rough scale rattail) to 0.22 ppm (lingcod), and for flesh ranged from 2.0 ppm (sablefish) to 0.035 ppm (lingcod). Maximum values for total DDT residues in some individual fishes approached or exceeded FDA limits of 5.0 ppm wet weight, e.g., for livers: sanddab 13 ppm, roughscale rattail 7.9 ppm, sablefish 6.9 ppm, English sole 6.1 ppm, and petrale sole 4.8 ppm; for flesh: sablefish 6.3 ppm and roughscale rattail 4.7 ppm.
[4 tables, 14 references] Author's abstract

9.19 KAISER REFRACTORIES ENVIRONMENTAL STUDIES
(9.6) FINAL REPORT: 1 JUNE 1971

Harville, John P. (editor)
Technical Publication 71-3, viii + 190 pp. (1970) (Moss Landing Marine Laboratories of the California State Colleges at Fresno, Hayward, Sacramento, San Francisco, and San Jose, Calif.)

In September 1967 the Moss Landing Marine Laboratories undertook a long range study of potential effects of Kaiser Refractories industrial effluent upon the marine environment of the Moss Landing area.

These investigations followed three primary thrusts:

1. Determination of physical characteristics and dynamics of the water mass in the proposed outfall area, and assessment of bottom structure, sediments, and sediment transport characteristics of the area.
2. Biological investigations of bottom fauna of the proposed outfall area, with ancillary studies of plankton, fishes, and intertidal fauna.
3. Field and laboratory studies of the impact of various dilutions of Kaiser effluent upon selected bioindicator plant and animal species.

[62 figures, 33 tables, 77 references, 2 appendices] From editor's introduction

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9.19 FREEZING OIL SPILLS
(0.8)

Cole, Edward L. (Fishkill, N.Y.), and Howard V. Hess (Glenham, N.Y.); assignors to Texaco Co. Inc. (pat.)
U.S. Patent 3,614,873
Official Gazette of the U.S. Patent Office 891, No. 4, 1359 (October 26, 1971)

Surface layers of oil are frozen with dry ice and the frozen layer is then screened off the surface as a cake. FTP

9.19 Na^+, K^+-ACTIVATED-ATPASE INHIBITION IN RAINBOW TROUT: A SITE FOR ORGANOCHLORINE PESTICIDE TOXICITY

Davis, Paul W. (Department of Pharmacology, University of Washington School of Medicine, Seattle, WA 98105), and Gary A. Wedermeyer (Western Fish Disease Laboratory, U.S. Department of the Interior, Seattle, WA 98115)
Comparative Biochemistry and Physiology 40, No. 3B, 823-827 (November 1971)

The authors found that chlorinated hydrocarbon pesticides inhibited in vitro the Na^+, K^+-activated, Mg^{2+}-dependent-ATPase enzyme system in a heavy microsomal fraction of rainbow trout (Salmo gairdneri) brain. They suggest that inhibition of ATPase activity may be a factor causing the toxic effects of organochlorine pesticides in fishes. [1 figure, 1 table, 17 references] FTP

9.19 CHEMICAL POLLUTION: POLYCHLORINATED BIPHENYLS

Hammond, Allen L.
Science 175, No. 4018, 155-156 (January 14, 1972)

The industrial chemicals polychlorinated biphenyls (PCBs) are widely distributed in the environment; they have been found in rainwater, in human tissue, and in many species of birds and fish. The PCBs apparently degrade very slowly under natural conditions. Also, they tend to accumulate in the food chain. Once they are ingested, the PCBs are stored in the fatty tissues of the body. Although small doses of chlorinated hydrocarbons can be toxic, it is not clear whether the amounts found in birds or fish have had any detrimental effect. FTP

9.19 POLYCHLORINATED BIPHENYLS: TOXICITY TO CERTAIN PHYTOPLANKTERS

Mosser, Jerry L., Nicholas S. Fisher, Tzu-Chiu Teng, and Charles F. Wurster (Marine Sciences Research, State University of New York, Stony Brook, NY 11790)
Science 175, No. 4018, 191-192 (January 14, 1972)

Polychlorinated biphenyls (PCBs), at concentrations as low as 10 to 25 parts per billion, reduced the growth rates of two species of marine diatoms; however, a marine green alga and two species of fresh-water algae were not inhibited at these or higher concentrations of the PCBs. Apparently, the sensitivity of these species to the PCBs paralleled their sensitivity to DDT. FTP
[2 figures, 23 references]

9.19 (9.3)(7.43)(0.4)

J. M. Anderson (Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick, Canada); pp. 307-320. [11 figures, 1 table, 21 references]

"Influence of Pesticides on Marine Ecosystems," by P. A. Butler (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Gulf Breeze, Fla. 32561); pp. 321-329. [2 tables, 6 references]

"Ecological Effects of Sewage Discharge in the Marine Environment," by A. J. O'Sullivan (Lancashire and Western Sea Fisheries Joint Committee, 16, Walton's Parade, Preston, Lancashire, England); pp. 331-351. [1 figure, 1 table, 52 references]

"Some Changes in Intertidal Sand Communities Due to Thermal Pollution," by P. R. O. Barnett (Marine Station, Millport, Isle of Cumbrae, Scotland); pp. 353-364. [10 figures, 21 references]

III. Effects of Particular Pollutants

"Mercury Pollution in Sweden With Special Reference to Conditions in the Water Habitat," by H. Ackefors (Institute of Marine Research, S-453 00 Lysekil, Sweden); pp. 365-387. [11 figures, 12 tables, 71 references]

"The Effects of Heavy Metals (Other Than Mercury) on Marine and Estuarine Organisms," by G. W. Bryan (The Laboratory, Citadel Hill, Plymouth, England); pp. 389-410. [9 figures, 4 tables, 77 references]

"Effects of Oil and Oil Dispersants on the Marine Environment," by R. G. J. Shelton (Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Burnham-on-Crouch, Essex, England); pp. 411-422. [18 references]

"The Biological Effects of Radioactive Wastes," by D. S. Woodhead (Ministry of Agriculture, Fisheries and Food, Radiobiological Laboratory, Lowestoft, Suffolk, England); pp. 423-437. [5 figures, 6 tables, 38 references]

Continued on Card B

9.19 TOXICITY OF KRAFT MILL EFFLUENT TO SELECTED ESTUARINE ORGANISMS FROM YAQUINA BAY, OREGON

Parrish, Loys P., and Howard F. Horton (Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR 97331)
Northwest Science 45, No. 4, 244-251 (November 1971) (Published quarterly by Washington State University Press, Pullman, WA 99163, with collaboration of Northwest Scientific Association)

Median tolerance limits (TL_m'S) of unbleached kraft mill effluent were estimated for white seaperch, striped seaperch, kelp greenling, starry flounder, English sole, and Dungeness crab. Also, preliminary information is reported on pile perch and walleye surfperch.
[2 tables, 20 references] FTP

9.2 (9.3)(9.4) A PROPOSAL FOR PARTICIPATING IN NATURAL RESOURCE DEVELOPMENT STARTING WITH THE HIGH SEAS

Edwards, Daniel James (Department of Economics, University of Maryland, College Park, MD 20740)
Natural Resources Journal 11, No. 4, 636-656 (October 1971)

This article is an inquiry into the possibility of establishing a new institutional guideline to develop and distribute the natural resources in and under the high seas. The author proposes a new type of joint venture which would attract investors to explore and to develop natural resources by a specified target rate of return which includes any needed risk premium. When the investors have recovered their initial investment and are earning the cumulative target rate of return, any additional return (economic rent) is distributed to the entire world. [40 footnotes] FTP

9.3 (9.19) ENVIRONMENTAL POLICY: THEORY, CONCEPTS AND PROCESSES [A SYMPOSIUM]

(Authors and subjects listed below)
Natural Resources Journal 11, No. 3, 403-517 (July 1971)

Environmental policy is a relatively new field and still lacks a body of theory. The purpose of this symposium was to contribute towards a theoretical basis for environmental policy; the 12 articles are oriented along theoretical, conceptual, and philosophical lines.

"Environmental Policy and the Congress," by Henry M. Jackson (United States Senator, Washington, D.C.), pp. 403-415. [27 footnotes]

"Environmental Policy in a Hypertrophic Society," by Lynton K. Caldwell (Indiana University, Bloomington, Ind.), pp. 417-426. [11 footnotes]

"The Environmental Movement: Ambiguities and Meanings," by Grant McConnell (University of California [Santa Cruz Campus], Santa Cruz, Calif.), pp. 427-435. [1 footnote]

"Political and Social Accommodation: The Political Process and Environmental Preservation," by Norman Wengert (Colorado State University, Fort Collins, Colo.), pp. 437-446. [5 footnotes]

"Environmental Policy and Politics: Value and Power Context," by Daniel H. Henning (University of New Mexico, Albuquerque, N. Mex.), pp. 447-454. [21 footnotes]

"The Coordination of Legislative Policy and the Regulation of Private Interests: Some Suggested Pragmatic Principles for Environmental Policy," by Wolfgang E. Burhenne (Interparliamentary Working Center, Bonn, Germany) and William A. Irwin (University of Michigan, Ann Arbor, Mich.), pp. 455-466. [17 foot-

 (over)

9.2 COSTS AND PROFITABILITY IN THE COMMERCIAL FISHING INDUSTRY: THE INSURANCE DILEMMA

Redfield, Michael L.
Washington Sea Grant Publication WSG-MP-71-4, 59 pp. (November 1971) (Division of Marine Resources, University of Washington, Seattle, WA 98195)

The purpose of this discussion is to explore the problem of high cost of insurance coverage for fishing vessels in order to discover to what extent it causes and is caused by other problems, and to examine and evaluate several possible methods of resolution. The author concludes that without restrictions on additional entry into a fishery, no relief from high fishing costs can be lasting. Therefore, any solution to the problem of high insurance costs must include limited entry.

On the basis of limited comparison of costs and benefits, the final choice among the alternatives for alleviating the insurance problem consists of a program of safety regulation combined with either scheduling of injury awards (as is done under workmen's compensation programs), premium or recovery subsidies, or elimination of barriers to the use of foreign-built vessels, gear, and equipment. [6 figures, 98 footnotes] FTP

9.6 (6.9) ABSTRACTS AND SUMMARIES OF LITERATURE ON DRUGS FROM THE SEA 1967-1970

Auffhammer, Ida Wallis, and Wm. B. Deichmann (University of Miami Sea Grant Program, Miami, FL 33149)
Sea Grant Technical Bulletin No. 16, University of Miami Sea Grant Program (Pharmacology), 191 pp. (May 1971) Price $6.00. (Information Services, University of Miami, Sea Grant Institutional Program, 10 Rickenbacker Causeway, Miami, FL 33149)

The Bulletin contains 643 abstracts, summaries, and references related to drugs from the sea arranged according to actual or potential application in medicine and subdivided as to phylogenetic order of the source. It contains author and subject indexes. FTP

9.3 THE COMMON LAW OF WATER

Libicki, Samuel (University of Chicago Law School, Chicago, Ill.) Edited by Walter C. Clements, Roy H. Olson, and Bruce L. Simpson.
Limnos 4, No. 3, 1-36 (Fall 1971)

This is a report of a research study into the basic law of water rights from the old English law to modern times, with particular attention to important American fresh water decisions in the Midwestern States (does not include statutes or decisions interpreting legislation). The price of the individual report is $5.00 and may be obtained from the Great Lakes Foundation, 2200 North Campus Blvd., Ann Arbor, MI 48105. FTP

9.6 ENCYCLOPEDIA OF FOOD ENGINEERING
(0.8)

Hall, Carl W., A. W. Farrall, and A. L. Rippen
Published by the Avi Publishing Co. Inc., P.O. Box 670, Westport, CT 06880 (1971), vol. 1, 755 pp. Price $52; $53 foreign.
Neil H. Mermelstein (reviewer)
Food Technology 25, No. 12, 93 (1305) (December 1971)

This book is part of the "Encyclopedia of Food Technology and Food Science Series." It contains over 800 entries. It emphasizes the equipment and facilities used in food handling, preparation, and transportation. The book contains more than 300 illustrations and 200 tables. FTP

9.2 ECONOMIC CONDITION OF SELECTED PACIFIC NORTHWEST SEAFOOD FIRMS

Smith, Frederick J. (Department of Agricultural Economics, Oregon State University, Corvallis, OR 97331)
Special Report 327, OSU Sea Grant, 14 pp. (September 1971) (Agricultural Experiment Station, Oregon State University, Corvallis, OR 97331)

Pacific Northwest fishermen operate competitive, small, independent firms under varying and frequently conflicting regulations. They must deal with small, isolated, high-cost gear and vessel repair and supply firms and with strong independent and/or corporate seafood processors. Pacific Northwest fishermen are looked upon as high-risk, low-return businesses by lenders and insurance firms.

Returns to management for nine above-average composite Northern California, Oregon, and Washington vessels range from $-15,842 to $3,021. Returns to labor and management range from $-4,462 to $22,207, and returns to labor, management, and investment range from $2,032 to $27,081. These returns are generally higher than for longliners, trawlers, draggers, and seiners operating in the northwest Atlantic and generally lower than returns to Georgia shrimp vessels.

Opportunities for improving the economic condition of fishing firms exist through better cost control of such items as gear repair, vessel repair, and insurance and through greater efficiency (catch/unit effort). Price increases may prove beneficial with appropriate improvements in controlling total resource exploitation and improved understanding of demand elasticity.

Processors and distributors operate under less complicated state and federal regulations, but must contend with variable raw product supplies, variable raw product quality, unionized but relatively immobile labor supply, and an unpredictable retail market.

Opportunities for improvement appear to include better control of raw product purchasing and increased efficiency of in-plant labor.
[13 tables, 32 references] Extract of author's summary

9.3 (9.19)

"The Role of Litigation in Environmental Policy: The Power Plant Siting Problem," by David Sive (Winer, Neuburger & Sive, New York, N.Y.), pp. 467-477. [15 footnotes]
"The Bureaucratic Response to Environmental Law," by Geoffrey Wandesforde-Smith (University of California, Davis, Calif.), pp. 479-488. [34 footnotes]
"Environmental Policy: Public Participation and the Open Information System," by Harvey Frauenglas (Environmental Reporter Foundation, Albuquerque, N. Mex.), pp. 489-496. [11 footnotes]
"Public Participation and Environmental Quality," by Arnold W. Bolle (School of Forestry, University of Montana, Missoula, Mont.), pp. 497-505. [14 footnotes]
"International Environmental Management: Some Preliminary Thoughts," by Thomas W. Wilson, Jr. (International Institute for Environmental Affairs, Washington, D.C.), pp. 508-512. [1 footnote]
"Environmental Policy and International Institutional Arrangements: A Proposal for Regional and Global Environmental Protection Agencies," by Albert E. Utton (School of Law, University of New Mexico, Albuquerque, N. Mex.), pp. 513-517. [12 footnotes] FTP

9.3 PROSPECTS FOR A NEW REGIME OF THE SEAS: INTERNATIONAL POLITICAL CONSIDERATIONS

Padelford, Norman J. (Ocean Engineering Department, Massachusetts Institute of Technology, Cambridge, Mass. 02139)
Sea Grant Project Office, Report No. MITSG 72-5 (Index No. 72-605-Npe), Massachusetts Institute of Technology, 13 pp. (November 1, 1971)

In this article, the author discusses the present situation relative to the law of the sea and suggests several possible grounds for compromise for seeking agreement on some of the controversial issues.
[19 references] FTP

9.6 FUNDAMENTALS OF FOOD ENGINEERING
(0.8)

Charm, S. E.
Published by the Avi Publishing Co. Inc., P.O. Box 670, Westport, CT 06880 (1971, 2nd Ed.), 629 pp. Price $29 U.S., $30 foreign.
Neil H. Mermelstein (reviewer)
Food Technology 25, No. 12, 93 (1305) (December 1971)

This book is the revised and updated edition of the first one published in 1963. Some of the added sections are on nonequilibrium thermodynamics, refrigeration, centrifugation, ultrafiltration or reverse osmosis, column chromatography, and foam separation of soluble components. The book is concerned with the application of engineering principles to foods; it is a valuable book for the food technologist and engineer. FTP

0.8 INVESTIGATIONS ON PHYSICOCHEMICAL COMPOSITION OF FISH INDUSTRY WASTE WATERS

Bachanek, Stanisław (Zakł. Ochr. Wod, Gdansk, Poland)
Chemical Abstracts 75, No. 26, 154800w (December 27, 1971)

0.8 OCEAN ENGINEERING SYSTEMS
(9.11)

Craven, John P. (Department of Ocean Engineering, University of Hawaii, Honolulu, Hawaii 96822) (Compiled and edited by T. Gray Curtis, John R. Mittleman, and James M. Patell)
Massachusetts Institute of Technology, Sea Grant Project GH-88, 525 pp. (1971) (The M.I.T. Press, Cambridge, MA 02142)

The material in this manual was developed for a course entitled "Ocean Engineering Systems" as part of the Ocean Engineering Program of the Department of Naval Architecture and Marine Engineering Program at the Massachusetts Institute of Technology (MIT). The case studies, appearing in each of the eight chapters of the report, were prepared by MIT students as part of their course requirements. Pertinent chapters and case studies are as follows.

Chapter I. "Ocean Engineering Systems." Case Study: "Mission Profile," by E. S. McGinley, II

Chapter II. "Platforms." Case Study: "A Disaster-Relief System (A First Iteration)" by Charles N. Calvano and Bruce Luxford.

Chapter III. "Life Support Subsystem." Case Study: "The Establishment of Tolerance Levels and Forecasting Procedures for the Influx of Pollutants onto the Continental Shelf Areas Adjacent to the Major Rivers of North America," by Ronald C. Gularte.

Chapter VII. "Environmental Sensing and Control Subsystem." Case Study: "Shore Protection System--Environmental Sensing and Control." by John R. Mittleman.

Chapter VIII. "Logistic Support and Maintenance." Case Study: "Nonpollutive Power System," by L. K. Donovan. FTP

3.237 FISH PREPARATION METHOD

Malin, Denis J. (Columbus, Ohio); assignor to Arthur Treacher's Fish & Chips, Inc., Columbus, Ohio (pat.)
U.S. Patent 3,622,348
Official Gazette of the U.S. Patent Office 892, No. 4, 1419 (November 23, 1971)

Raw frozen fish (at a temperature below 0° F.) are tempered in a refrigerator until they reach a uniform temperature of 25° F. Then, the fish are cut into serving portions, and the portions are battered and breaded, and deep fat fried. FTP

3.237 AUTOMATIC CARTONING OF FISH FINGERS

Anonymous
Food Manufacture 46, No. 10, 47, 49, 51 (October 1971)

This article describes a fully automatic fish finger [fish stick] unscrambling, collating, and cartoning line capable of packing fish sticks in cartons of up to 185 cartons per minute. [1 illustration] FTP

Fish meat is immersed in a glazing solution and then is frozen in a block form. The frozen block is cut into portions. FTP

Food Technology 25, No. 11, 118 (November 1971)
Japanese Patent 16940/71
Kyokuto Sangyo K.K. (pat.)

3.2 FISH PROCESSING

3.11 JELLIED FISH PRODUCT
(2.06)

Takeda Chemicals Inds. Ltd. (pat.)
Japanese Patent 18587/71
Food Technology 25, No. 11, 118 (November 1971)

A salt of a stearyl fumaric monoester or of a higher fatty acid ester of lactic acid is added to jellied fish products to improve their gel strength. FTP

3.11 FISH PASTE PRODUCT
(6.54)
Ajinomoto Inc. (pat.)
Japanese Patent 18590/71
Food Technology 25, No. 11, 118 (November 1971)

Polyvinylpyrrolidone is added to fish paste products prior to cooking in order to improve the keeping quality of the fish paste. FTP

Levulinic acid combined with potassium sorbate is used as an antimycotic to preserve meat and meatlike animal foods. FTP

Plains, N.Y. (pat.)
U.S. Patent 3,623,884
Official Gazette of the U.S. Patent Office 892, No. 5, 1781 (November 30, 1971)
Haas, Gerhard J. (Woodcliff Lake, N.J.); assignor to General Foods Corp., White

3.11 ANIMAL FOOD PRODUCTS

4.4 EFFECT OF STORAGE ON LIPIDS OF FISH PROTEIN CONCENTRATE
(6.54)

Medwadowski, Barbara, Alleah Haley, John Van Der Veen, and H. S. Olcott (Institute of Marine Resources, Department of Nutritional Sciences, University of California, Berkeley, CA 94720)
Journal of the American Oil Chemists' Society 48, No. 12, 782-783 (December 1971)

Earlier reports [B. F. Medwadowski, J. Van der Veen, and H. S. Olcott, J. Food Sci. 32, 361-365 (1967) and JAOCS 45, 709-710 (1968)] have described the nature of the residual lipids in fish protein concentrates (FPC) prepared from red hake and from Atlantic menhaden by isopropanol extraction. In the present article, the authors report the effects of storage of three different FPCs for 6 months at 37°C. and at 50° C. on their extractable lipids. The FPCs were made from pout, alewife, and Gulf menhaden.

When the amount of extractable lipid was 0.1% or less (in the FPCs from pout and alewife) there were only small changes in the lipid pattern--a small decrease in the amount of neutral lipid-free fatty acid fraction and larger decreases in the long chain, unsaturated fatty acids. In the Gulf menhaden FPC sample (containing residual lipid of about 0.5%), the amount of extractable lipid decreased after storage of the FPC for 6 months at 37° C. and 50° C. The extractable lipids in the menhaden FPC (after 6 months of storage) showed decreases in the neutral lipids plus free fatty acid fractions and decreases in the long chain, unsaturated fatty acids. [2 tables, 6 references] FTP

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